*BY ORDER OF THE SECRETARY OF THE AIR FORCE*

*AIR FORCE INSTRUCTION 11-2HC-130 VOLUME 3*

*28 APRIL 2015*

*Flying Operations*

# *HC-130--OPERATIONS PROCEDURES*

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This volume implements AFPD 11-2, *Aircraft Rules and Procedures*; AFPD 11-4, *Aviation Service*; and AFI 11-202V3, *General Flight Rules*. It applies to all HC-130 and Combat Search and Rescue (CSAR) MC-130P Regular Air Force (RegAF), Air Force Reserve Command (AFRC) and Air National Guard (ANG) units and their assigned Back-up Aircraft Inventory (BAI) aircraft. The OPR grants waivers only IAW with this instruction. The Paperwork Reduction Act of 1974, as amended in 1996 affects this instruction. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located at **https://www.my.af.mil/afrims/afrims/afrims/rims.cfm**.

This publication may be supplemented at any level. See **paragraph 1.6** for additional guidance on supplements requirements and coordination. Guidance on submitting comments and suggesting improvements for this publication are located in **paragraph 1.7** Waiver authority for this publication is defined in **paragraph 1.4**

## *SUMMARY OF CHANGES*

This instruction has been completely revised and must be reviewed in its entirety. Chapters and paragraphs have been reorganized to consolidate information and improve logical flow. A thorough review of this instruction is required by all aircrew to understand the implications of the reorganization. Changes by chapter and paragraph are as follows: 1.2. Applicability statement updated. 1.6 and 1.7. Supplement guidance revised for lead AFI guidance;

2.3.3.3.2.6.5. Added updated maintenance status codes. 2.5. Revised to reference PIC vice aircraft commander. 3.1.3. Clarification added for supervision requirements. Table 3.1. Revised for omissions. 3.3. Updated to reference mission essential personnel. 4.1.4. ANG and AFRC POCs updated. Table 4.1. Minimum Equipment listing updated. 4.8. Navigation system requirements consolidated within and updated as applicable. 5.5.2. Flap operation guidance revised, previous exception for CDS operations removed. 5.9. Advisory calls revised and updated. Tables 5.1 through 5.4 added. 5.12. Wake Turbulence guidance updated. 5.14.1. Guidance on LZ use without ARFF updated IAW parent directive. 5.15.2.1. Revised guidance provided for LZ operations and the use of other than hard surface runways. 5.15.3. NVG airland requirments updated and redundant information removed. 5.19. Contingency operations added to fuel jettision caveats. 5.22. All intersection takeoff information throughout chapter consolidated in this paragraph. Chapter 6. Has been reorganized/renumbered to consolidate information. All references to life support have been changed to aircrew flight equipment. 6.2.5. Excpetion added for FTU. 6.2.11. Revised guidance provided on survival and protective requipment. 6.6. Incorporated e-publication guidance for aircrew publications. Removed reference to C-130E BAI aircraft. 6.17. Fuel planning guidance updated. Fuel conservation guidance from other chapters consolidated under this paragraph. 6.19. Departure planning reference updated. Table 6.4. Authorization column updated. 6.20. Departure climbout references updated. 6.21.1.2. Thunderstorm avoidance criteria revised. 6.23. Risk Management broken out into main paragraph. 6.24.2. paragraph revised with regards to entry control requirements. 6.25.7. Entry control procedures updated. 6.31. Updated Aircrew Flight Equipment and Oxygen requirements. 6.31. Reference to LOX System changed to LOX converters. 6.31.3. Guidance for walk-around oxygen bottles expanded. 6.37.1. Guidance for parachute requirements updated. 6.31.9. Guidance for survival kits/vest updated. 6.33.6. Paragraph title change from MEGP to MEP. 6.34. Hazardous material procedures guidance and references updated. 6.38. NVG departure guidance revamped. 6.41. Navigational aid capability guidance updated. 6.46. CIRVIS guidance and references updated. 6.47. All general communication guidance from other chapters consolidated in this paragraph. 6.48. All general IFE procedures consolidated in this paragraph. Table 6.6. Conference Hotel information updated. 6.52. Cold Weather Altimeter setting guidance ammended to reference tactical requirements. 6.58. NVG approach and landing guidance revamped. 6.60.8. Clear water rinse guidance added for LAIRCM equipped aircraft. 6.61. Guidance for impoundment of aircraft revamped. 6.66. Boarder clearance guidance and references updated. 6.67. clearance procedures and references updated. 6.70. Insect and pest control procedures and references updated. 7.7. general references for anti-hijacking guidance updated. Table 7.1. Revamped to remove redundant information. Chapter 8 added AF IMT Form 853, Air Force Bird Strike Report Chapter 9 administrative changes. Chapter 10 Guidance revised and allows units the option of using chapter for local operating procedures. See updated paragraphs 1.6. and 1.7. for complimenting information. Chapter 11 Administrative updates incorporated. Standardized terminology for Automated Flight Planning System applied throughout chapter. All references to obsolete fuel planning documents removed. All new figures added for ETP calculations and 4116 examples. 11.2. Navigator specialized duties consolidated in this paragraph. 11.10. Suitable airfield definition updated. 12.6. Flight Engineer monitoring duties consolidated under this paragraph. 12.6.9. Over-torque guidance revamped. Table 12.1. Added 12.6.10.1. Deviation guidance updated. 12.8.5. approval authority clarified. 12.8.6. Stop-and-go runway requirements updated. 12.8.8. PJ MOS defined/clarified. 12.9. ASIP guidance updated. 12.10. AF IMT Form 4108 general guidance updated. 12.13. Hostile environment repair procedures guidance consolidated in this paragraph and revision for clarification. 13.1. General loadmaster responsibilities updated. 13.2. Loadmaster specific duties consolidated in this paragraph. 13.3. Additional loadmaster duties consolidated in this paragraph. 14.1. AMSS responsibilies and task consolidated under this paragraph. 14.3.2. Non-mission sortie AMSS requirements/references updated. Table 14.1. through 14.5. updated for administrative changes. Chapter 15 redesignated Mission Planning and General Employment Procedures. Applicable information migrated. All references to reference altitudes changed to NVG altitude. 15.4. Crew duties paragraph updated. 15.9. Mountainous terrain definition added. 15.13. Barometric altimeter updating guidance revised. Table 15.3. Minimum operating equipment table reformated and updated. Chapter 16 redesignated Enroute and Terminal Area Operations. Applicable information migrated. All references to reference altitudes changed to NVG altitude. 16.3. Search Operations added. 16.6.2. and 16.6.3.2. NVG altitude guidance updated to align with AFTTP. Table 16.1. Emergency Climb procedures, Step 8 updated. 16.8. Self-Contained Approach procedures revised and updated. 16.9. Added as place holder for self-contained departure procedures. Chapter 17 redesignated Airdrop Operations. Applicable information migrated. 17.5.1. Airdop altitudes and airspeed guidance updated. 17.3.2. Caution added for high elevation drop zones. Table 17.1. Standard Ground Party Voice Terminology for VIRS added. Table 17.1. Standard Voice Terminology for JMD added. 17.15.6. Joint Precision Airdrop System (JPADS) guidance incorporated. 17.15.7. Mission Computer Airdrops guidance consolidated and updated. Figure 17.1. SCNS OAP Card added. 17.22. Multiple Passes airdop guidance updated. 17.26. High altitude airdrop oxygen requirements revised and updated. Table 17.3. Prebreathing requirements and exposure limits for high altitude operations updated. 17.27.1. Cabin differential pressure management guidance revised. 17.27.11. High altitude emergency procedures revised. 17.28.5.1. Guidance regarding parachutist minimum acceptable parachute bailout altitude changed. 17.36. Specialized rescue airdrops guidance upated. 17.37. Low cost low altitude airdrop guidance added. 17.37.2. Minimum Drop Altitudes for night Freefalls changed. Chapter 18 added. Designated Refueling Operations. HAAR, Hot Refuleing and FARP guidance incorporated. Attachment 1 Terms and definitions revised and updated. Expanded Checklist Expanded checklist have broken out across four attachments. Attachment 2 (Tactical Airdrop Checklist). Pilot/Crew/Loadmaster Dropsonde Checklists and Precision Airdrop System Operator Preflight Checklist added. Precision Airdrop System procedures have been added to the Pilot/Crew Air Drop Checklist for guided and improved airdrop deployments. Loadmaster Container Delivery System and Personnel/Equipment Checklists have been updated with Joint Precision Airdrop System procedures for guided and improved airdrop deployments. Attachment 3 (Search and Rescue Checklist), A “Depressurized” call has been added to Pre-Search/Pre-Deployment Checklist. Attachment 4 (Hot Refueling/FARP Checklist), Attachment 5 (Misc Checklist).

# Chapter 1

## GENERAL INFORMATION

**1.1. General.** This instruction provides policy for operating HC-130 and CSAR MC-130 aircraft. It is an original source document for many areas but restates information found in aircraft flight manuals, flight information publications (FLIP), and other Air Force directives. When guidance in this AFI conflicts with another basic/source document, that document takes precedence. For matters where this AFI is the source document, waiver authority is in accordance with (IAW) **paragraph 1.4** ACC/A3JO, Personnel Recovery Operations, has overall responsibility for the administration of this volume.

**1.2. Applicability.** This instruction is applicable to all HC-130 and CSAR MC-130P aircraft. Unless otherwise specifically stated, all reference to the HC-130 in this instruction also apply to CSAR MC-130 aircraft.

**1.3. Terms and Definitions.** Refer to **Attachment 1** for a glossary of references, abbreviations, and terms.

1.3.1. **(T-1)** "Will" and "Shall" indicate a mandatory requirement.

1.3.2. **(T-1)** "Should" indicates a recommended procedure that is required, if practical.

1.3.3. **(T-1)** "May" indicates an acceptable or suggested means of accomplishment.

1.3.4. **(T-1)** ***"NOTE"*** indicates operating procedures, techniques, etc., which are considered essential to emphasize.

1.3.5. **"*CAUTION*"** indicates operating procedures, techniques, etc., which may result in damage to equipment if not carefully followed.

1.3.6. "***WARNING***" indicates operating procedures, techniques, etc., which may result in personal injury or loss of life if not carefully followed.

**1.4. Deviations and Waivers.** Do not deviate from policies in this AFI except when the situation demands immediate action to ensure safety. The Pilot in Command (PIC) is vested with ultimate mission authority and responsible for each course of action they choose to take.

1.4.1. Deviations. (T-1) The PIC shall report deviations and exceptions taken without waiver, through Stan/Eval channels to MAJCOM/A3 within 48 hours, followed by a written report, if requested.

1.4.2. Waivers. The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See AFI 33-360, *Publications and Forms Management*, for a description of the authorities associated with the Tier numbers. Unless otherwise directed or annotated, waiver authority for contents of this instruction (to include T-1 and T-2) waivers is the MAJCOM/A3 with mission execution authority or COMAFFOR for contingency/expeditionary operations when units experience a change of operational control (CHOP).

1.4.2.1. Approved waivers are issued for a maximum of one year from the effective date.

1.4.2.2. COMAFFOR will notify HQ ACC/A3 of waivers to this instruction within 72 hours of issuance.

1.4.2.3. Submit waiver requests through Stan/Eval channels.

**1.5. Distribution.** (T-1) Unit commanders shall ensure all aircrew members are provided current copies and changes.

**1.6. Supplements. (T-1)** This AFI is a basic directive. Supplement this volume IAW AFI 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure* and AFI 33-360, *Publications and Forms Management.* Supplements will not duplicate or be less restrictive than the provisions of this instruction.

1.6.1. MAJCOM Supplements. Forward MAJCOM supplements to AFFSA/A3OF for review and coordination prior to approval and publication. Copies of approved and published supplements will be provided by the issuing office to AFFSA/A3OF, ACC/A3J, and the user MAJCOM office of primary responsibility (OPR).

1.6.2. Local Supplements. Operations Groups commanders (OG/CC) shall define local operating procedures in a unit supplement to this instruction. (T-1)

1.6.2.1. Units may consolidate supplemental information in **Chapter 10**, integrate information throughout the AFI, or a combination of both.

1.6.2.2. Draft supplements will be coordinated through the unit's respective MAJCOM office of primary responsibility (OPR), ACC/A3J and AFFSA/A3OF, in turn, prior to approval and publication (T-1).

1.6.2.3. Copies of approved and published supplements will be provided by the issuing office to MAJCOM office of primary responsibility (OPR).

**1.7. Improvement Recommendations and Reviews. (T-1)** Send comments and suggested improvements to this instruction on AF Form 847, **Recommendation for Change of Publication**, through Stan/Eval channels to HQ ACC/A3TV. HQ ACC/A3J will normally lead a MAJCOM level review of this instruction within six months of the publication of a respective AFTTP 3-3.HC-130, *Combat Aircraft Fundamantals-HC-130*.

# Chapter 2

## COMMAND AND CONTROL

**2.1. General.** The ACC command and control (C2) system is based on the principles of centralized monitoring and decentralized control and execution. The result is a C2 mechanism which keeps the ACC Commander informed of the current status of ACC forces while enabling the wing or group commander to exercise control over day-to-day operations.

**2.2. Operational Control (OPCON).** ACC and AFRC are designated as the controlling agency for assigned Air Force aircraft, while theater commands have operational control (OPCON) of theater-based assets. Reserve Component (RC) missions for non-mobilized assets are controlled through applicable ANG and AFRC C2 centers. In practice, responsibility for planning and executing ACC missions is routinely delegated to the wing or group commander. The wing or group commander, in turn, exercises control of non-close-hold missions through the command post supporting the wing. In the event that assigned forces undergo a change in operational control (CHOP), responsibility for mission monitoring passes from the wing or group C2 facility to the gaining command. Changeover will be accomplished IAW the pertinent OPLAN, OPORD, or deployment or execution order (T-0). ***NOTE:*** For certain close-hold activities, security considerations may compel the wing or group commander to shift mission monitoring responsibilities from the command post to another wing agency. The wing or group commander will ensure procedures are established for the responsible agency to monitor mission progress and advise the MAJCOM/A3 and Commander Air Combat Command (COMACC) as appropriate (T-1).

**2.3. Mission Monitoring.** Except for selected close-hold missions, the ACC Command Center monitors all ACC aircraft that move to, from, or between OCONUS off-station locations. Key components of the ACC C2 system are the Global Command and Control System (GCCS) and the various C2 facilities at theater and wing locations. When aircraft are deployed in support of operations and exercises, the Command Center may obtain additional information from Situation Reports (SITREP) and Deployed Status Reports (DSR). The following mission monitoring procedures primarily apply to missions that are not close-hold in nature and have not had operational control changed to another command:

2.3.1. The respective unit command post tracks CONUS movements of their aircraft based on aircrew reports.

2.3.2. Information on OCONUS movements of ACC aircraft is relayed to the ACC Command Center (DSN: 574-5411; commercial: 757-764-5411) via telephone notification from host wing command posts. The host wing command posts receive their data directly from aircrew or via the en route facility's local command post.

2.3.3. The following paragraphs summarize mission commander, or if none is assigned, pilot in command duties with regard to flight reporting:

2.3.3.1. Missions at bases with a C2 Facility. The mission commander or pilot in command will ensure that at least 30 minutes prior to landing, the following information is relayed to the applicable C2 facility: call signs, mission numbers, ETAs, maintenance status, and additional service requirements (T-2). After landing, the mission commander or pilot in command will contact the C2 facility with ground handling requirements and departure information (T-2). In addition, CONUS based crews operating OCONUS must keep their home station command posts appraised of all actual takeoff and landing times, projected takeoff times, and other related information. Home station command posts relay information to the ACC Command Post. These actions keep the ACC Commander apprised of the locations and status of OCONUS forces. When forces CHOP to another theater commander, reporting will be through theater C2 centers upon arrival in the assigned area of responsibility (T-0).

2.3.3.2. Missions at Bases without a C2 Facility. The mission commander or pilot in command will report, as soon as possible, actual takeoff and landing times, maintenance status, projected takeoff times, and other pertinent data to the host wing command post or command center (T-2). Methods of communicating this information include HF phone patch, satellite communication (SATCOM), satellite phone (SATPHONE), DSN, and commercial telephone. Refer to the FLIP, Flight Information Handbook, USAF High Frequency Single Side Band (HF/SSB) Airways and Command and Control Station section for guidance on mission reporting.

2.3.3.2.1. Accomplish movement reporting when crew duties and safety permit but no later than 30 minutes after the event (1 hour for AFRC).

2.3.3.2.2. If unable to contact ACC command post (applicable RC command post for ARC missions) or Deployed Tanker Airlift Control Center via HF/SSB, retain information for submission via voice to the controlling command and control center (CCC) when contact is reestablished.

2.3.3.2.3. Restrict HF transmissions to operational traffic, i.e., movement reporting, itinerary revisions, maintenance status, flight plan information, weather and/or aircraft emergencies, or other important flight information, as appropriate.

2.3.3.2.4. If experiencing problems complying with these procedures, report problems to the next CCC contacted. The CCC transmits the reporting problems to the ACC command post (applicable RC command post for ANG or AFRC missions).

2.3.3.3. En Route Reporting: En route reports are not required unless specified in an OPORD/OPLAN or other mission directive.

2.3.3.3.1. Unless shorter flight legs dictate, when approximately 3 hours from destination, contact the destination, CCC, or if no CCC is available, contact the ACC command post (applicable RC command post for ANG/AFRC missions) via HF radio. Upon initial contact, confirm your arrival message has been received and update your ETA. If your arrival message has been received, no further information need be transmitted. If your arrival message has not been received, pass the following:

2.3.3.3.1.1. Mission number

2.3.3.3.1.2. Estimated Time of Arrival (ETA)

2.3.3.3.1.3. VIP code. Transmit VIP and honors code in accordance with FLIP planning document. Send the VIP code of each VIP on board.

2.3.3.3.2. When within UHF/VHF range, contact the destination CCC with the following information, unless previously transmitted.

2.3.3.3.2.1. Mission number

2.3.3.3.2.2. ETA

2.3.3.3.2.3. VIP code and requirements (if applicable)

2.3.3.3.2.4. Number of passengers

2.3.3.3.2.5. Hazardous cargo and remote parking requirements (if applicable)

2.3.3.3.2.6. Maintenance status:

2.3.3.3.2.6.1. **A-1.** No maintenance required.

2.3.3.3.2.6.2. **A-2 (Plus Noun).** Minor maintenance required, but not serious enough to cause delay. Add the noun(s) that identify the affected unit(s) or system(s); that is, hydraulic, UHF radio, radar, engine, fuel control, generator, etc. Further elaboration is discouraged.

2.3.3.3.2.6.3. **A-3 (Plus Noun)**. Major maintenance. Delay is anticipated. Affected unit(s) or system(s) are to be identified as in A-2 status above.

2.3.3.3.2.6.4. **A-4.** Aircraft or system has suspected or known radiological contamination plus any additional servicing requirements.

2.3.3.3.2.6.5. **A-5.** Aircraft or system has suspected or known battle damage.

2.3.3.3.3. VIP Messages. Airborne classified messages originated by VIP passengers may be transmitted at the discretion of the pilot in command.

2.3.3.4. Close-Hold or Sensitive Missions. Command and control procedures are IAW tasking directive.

**2.4. Mission Commander (T-3).** A mission commander will be designated when more than one aircraft or crew is deployed away from home station for training, exercises, or other operations. The mission commander should be a field grade officer. Mission commander duties include, but are not limited to:

2.4.1. Briefing crews on local operating procedures.

2.4.2. Coordinating with air traffic control (ATC), CCT, STS, range control, and other users that may have an impact on the mission.

2.4.3. Ensuring that drop zones (DZ) or landing zones (LZ) have current surveys (when necessary).

2.4.4. Ensuring personnel have ample and adequate billeting, eating, and transportation arrangements.

2.4.5. Ensuring maintenance personnel know of aircraft and fuel requirements.

2.4.6. Submitting timely reports on aircraft movements (see **paragraph 2.3.3**).

**2.5. Pilot in Command (PIC) and Authority.** The Flight Authorization designates a PIC for all flights. The PIC is:

2.5.1. In command of all persons on board the aircraft.

2.5.2. Responsible for the welfare of their crew.

2.5.3. Vested with the authority necessary to manage their crew and safely accomplish the mission.

2.5.4. The final mission authority and will make decisions not specifically assigned to a higher authority (T-1).

2.5.5. The final authority for accepting any waivers affecting the crew or mission.

2.5.6. Charged with keeping the applicable C2 or executing agencies informed of mission progress.

2.5.7. Responsible for the timely reporting of aircraft movements in the absence of a mission commander (see **paragraphs 2.3.3** and **2.4**).

**2.6. Mission Clearance Decision (T-1).** The final decision to delay a mission may be made either by the agency with OPCON or the PIC when, in the opinion of either, conditions are not safe to start or continue a mission. Final responsibility for the safe conduct of the mission rests with the PIC. If the PIC refuses a mission, it will not depart until the conditions have been corrected or improved so that the mission can operate safely. Another PIC and aircrew will not be alerted to take the same mission under the same conditions.

2.6.1. Diverting or rerouting a mission must be authorized by the commander with OPCON, except in an emergency or when required by en route or terminal weather conditions or facilities. In the event of an emergency or weather-related divert or reroute, the mission commander or PIC must notify the controlling authority as soon as possible.

2.6.1.1. The controlling agency directing the rerouting or diversion is responsible for ensuring destination requirements or facilities are adequate for the aircraft.

2.6.1.2. The PIC will notify the controlling agency of any aircraft or aircrew limitations that may preclude diverting or rerouting the mission.

2.6.2. When directed to an alternate airfield, the PIC will request enroute weather, existing and forecast weather for the alternate, notices to airmen (NOTAMs), and appropriate airfield information from the Airfield Suitability and Restrictions Report (ASRR) from the C2 center agency. If the planned alternate becomes unsuitable while en route, the PIC will coordinate with the C2 center for other suitable alternates. The PIC is final authority on selecting a suitable alternate. The PIC will also coordinated with the C2 center agency for customs and ground service requirements prior to arrival.

**2.7. Posse Comitatus.**

2.7.1. **(T-0)** The Posse Comitatus Act (PCA) of 1878 (18 U.S.C. § 1385) prohibits the direct active participation of military forces to execute civilian laws unless otherwise authorized by law. This Act does not apply to non-federalized Air National Guard forces in State Active Duty (SAD) status or Title 32 U.S.C. status. To the extent authorized, the Air Force may provide indirect support and/or assistance in restoring public health and services, and civil order.

2.7.2. **(T-1)** It is DoD Policy to cooperate with civilian law enforcement officials to the maximum extent practicable. AFI 10-801, *Defense Support to Civilian Authorities (DSCA)*, incorporates that directive and provides uniform policies and procedures to be followed concerning support provided to federal, state, and local civilian law enforcement agencies. It establishes specific limitations and restrictions on the use of Air Force personnel, equipment, facilities, and services by civilian law enforcement organizations. Report all requests for assistance and coordinate all requests from civilian law enforcement authorities through the appropriate command and control channels.

# Chapter 3

## CREW COMPLEMENT AND MANAGEMENT

**3.1. Aircrew Member Qualification. (T-1)** An aircrew member will be qualified or in training for qualification in that crew position, mission, and mission design series (MDS) aircraft to perform duties as a primary aircrew member.

3.1.1. Pilots. Non-current or unqualified pilots may perform crew duties only on designated training or evaluation missions under the supervision of a certified instructor or flight examiner pilot (direct Instructor supervision during critical phases of flight). ***NOTE:*** Critical phases of flight are defined as takeoff, approach and landing, and all tactical mission events. ***NOTE*****:** The PIC maintains ultimate responsibility of the overall conduct of the mission. Transfer of pilot-in-command duties between qualified ACs will be briefed to the crew.

3.1.1.1. Basic qualified pilots may perform primary crew duties on any non-mission sortie and on unilateral training, joint training, and exercises mission sorties when receiving mission qualification training or evaluations under the supervision of a certified instructor or flight examiner in their respective crew position. ***NOTE:*** Senior leaders who complete a Senior Staff Qualification course (restricted AF IMT 8, *Certificate of Aircrew Qualification*) or orientation for a Senior Staff Familiarization flight may occupy a primary crew position when under direct instructor supervision.

3.1.1.2. Mission qualified pilots may perform primary crew duties on any unilateral training mission. For other missions, the unit commander must determine the readiness of each mission capable crewmember to perform primary duties.

3.1.1.3. A Mission Computer Airdrop (MCAD) certified mission pilot will be in the seat during MCADs. ***EXCEPTION:*** During MCAD certification training, the instructor pilot may be standing for training with the pilot in upgrade in the seat. ***NOTE***: A MCAD crew consists of a certified pilot and navigator or a pilot and navigator receiving MCAD certification training from an instructor of like crew position.

3.1.2. Navigators**.** A non-current or unqualified navigator may serve as a primary aircrew member on any mission when supervised by a certified instructor or flight examiner.

3.1.2.1. Grid Navigator requirement. SQ/CC shall include a grid-qualified navigator on aircrews tasked to fly north of 65°N latitude, south of 70°S latitude, or in airspace where FLIP en route charts indicate compass indications may be erratic or depict airways, tracks, or navigational aids as oriented to true or grid north (i.e. Canadian Northern Airspace). (T-1) ***EXCEPTIONS:***

3.1.2.1.1. Flights within Alaskan airspace.

3.1.2.1.2. Flights on published airways using magnetic references. Destination and alternates must have published magnetic instrument approaches.

3.1.2.1.3. Aircraft equipped with two or more operable independent navigational systems.

3.1.2.2. An MCAD certified navigator will be in the seat during mission computer airdrops. ***EXCEPTION:*** During MCAD certification training, the IN may be standing for training with the navigator in upgrade in the seat.

3.1.3. Flight Engineers, Airborne Mission Systems Specialists (AMSS), and Loadmasters. A non-current or unqualified aircrew member may serve as a primary crewmember on any mission when supervised by a certified instructor or flight examiner of like crew position (direct supervision for critical phases of flight).

**3.2. Crew Complement. (T-1)** Minimum crew complement will be as specified in the flight manual and **Table 3.1** Only one LM is required on augmented crews if other crewmembers can periodically scan the cargo compartment. Unless noted in **Table 3.1**, the group commander is the waiver authority for all other crew positions below the minimum specified by the flight manual.

**Table 3.1. HC-130 Crew Complement (T-1).**

| | **Basic** | **Mission** | **Augmented** |
|---|---|---|---|
| **AC** | 1 | 1 | 2 |
| **CP/Pilot** | 1 | 1 | 1 |
| **Navigator** | 1 [1,2] | 1 | 2 |
| **Flight Engineer** | 1 | 1 | 2 |
| **Loadmaster** | 1 [6] | 2 [4,5,6] | 2 |
| **AMSS** | 1 [3] | 1 [3] | 2 |
| **PJ/CRO** | | As required [7] | As required [7] |

***NOTES:***

(1) Unit/mission commanders may authorize flights without a navigator on board for pilot proficiency (Pilot Pro) sorties. Units will establish procedures regarding the use of navigators on pilot proficiency trainers.

(2) Maximum Effort Airland and Hot Refueling operations (not including FARP Tanker operations) may be accomplished in a non-tactical environment without a navigator onboard.

(3) AMSS are not required for pilot proficiency sorties. Unit commanders may authorize home station mission training sorties without an AMSS on board when not required for mission accomplishment. Units will establish local operating procedures, regarding the use of AMSS on sorties.

(4) Two loadmasters are required for the following mission events:

a) The following Ramp and door airdrops: S/L Personnel, rigged alternate method zodiac (RAMZ), container ramp load (CRL), container delivery system (CDS), and combat rubber raiding craft (CRRC)
b) Airdrops when both paratroop doors are open
c) Freefall personnel airdrops above 10,000 feet MSL
d) Simultaneous HAAR
e) FARP tanker operations
f) Door bundles or rescue drops (parabundles and free fall) weighing more than 100 lbs
g) Flare/pyrotechnics handling
h) When performing MA-1 kit drops without air deflectors installed on the ramp

i) free fall/parabundle airdrops using trail line procedures

***EXCEPTION:*** A loadmaster and another thoroughly briefed crew member meet requirements for events f), g), h) and i).

(5) Instructor Loadmaster (IL) and two students are considered full mission complement on formal school training sorties, except HAAR when accomplishing simultaneous contacts.

(6) Two LMs or one LM and another qualified crewmember are required if more than 40 passengers are scheduled to be carried (***EXCEPTION:*** unit moves or contingencies). Both crewmembers must remain in the cargo compartment.

(7) Guardian Angel (GA) is part of the HC-130 mission crew complement for rescue missions involving pararescue employment. Minimum GA crew compliment is based on employment requirements and defined by AFI 16-1202V3 and appropriate AFTTP GA volume.

**3.3. Mission Essential Personnel (MEP). (T-1)** See AFI 11-401, *Aviation Management* for additional information.

**3.4. Interfly.** Interfly is the exchange and/or substitution of aircrew members and/or aircraft between MAJCOMs to accomplish flying missions. Normally, interfly should be limited to specific operations, exercises, or special circumstances but, may be used to relieve short-term qualified manpower shortfalls.

3.4.1. Unless specified in a MAJCOM-to-MAJCOM MOA:

3.4.1.1. Aircraft ownership will not be transferred. **(T-1)**

3.4.1.2. The unit with operational control of the mission is responsible for the publication/maintenance/retention of the aircraft FAs for each mission flown by the aircraft. (T-1)

3.4.1.3. Crews will be qualified in the MC/HC-130. Differences training may be required between different series aircraft. See AFI 11-2HC-130V1. (T-1)

3.4.1.4. Crewmember(s) will follow operational procedures defined in AFI 11-2HC-130V3, AFTTP 3-3.HC-130 and the applicable technical orders for the MDS. (T-1)

3.4.1.5. The MAJCOM with aircraft ownership will retain all flight and ground mishap reporting responsibility. **(T-1)**

3.4.2. Approval Authority**.** The OG/CC is the approval authority for interfly on aircraft under his/her control. (T-1)

**3.5. Intrafly. (T-1)** Intrafly is the exchange and/or substitution of aircrew members from separate units under the same MAJCOM to accomplish flying missions. Normally, intrafly should be used only to relieve short-term qualified manpower shortfalls.

3.5.1. The OG/CC possessing the aircraft is approval authority for intrafly between units.

3.5.2. As a minimum, crews will be qualified in the aircraft, as well as systems or configuration required to fly the aircraft and/or mission. If non-current, comply with **paragraphs 3.1.1**, **3.1.2**, and **3.1.3**

**3.6. Flight Duty Period, Crew Duty Period and Crew Rest Restrictions. (T-1)** Reference AFI 11-202V3. Flight Duty Period (FDP) falls within the constraints of the Crew Duty Period (CDP). FDP and CDP both begin when aircrew members report for official duties. The maximum Flight Duty Period is 16 hours for a basic crew. An aircrew member's Crew Duty Period is a maximum of 18 hours or FDP plus two hours. The addition of CDP is intended for a basic crew to complete aircrew duties at the aircraft after engine shutdown; (e.g. cargo loading/offloading, refueling, etc.). ***NOTE*****:** (AFRC and ANG only) CDP and FDP include both military duty and civilian work. It begins when the individual reports for his or her first duty period (military or civilian). FDP ends with engine shutdown at the end of the mission or series of missions. CDP extends up to two hours after FDP ends. When crewmembers perform other duties prior to flight-related duties (including civilian work for AFRC and ANG crewmembers), CDP/FDP begins when reporting for the other duties. ***NOTE*****:** Waiver authority for **paragraph 3.6** is MAJCOM/A3 or deployed equivalent unless otherwise noted.

3.6.1. Flight Duty Period (FDP). IAW AFI 11-202V3 and ACC Supplement, FDP is the period that starts when an aircrew reports for a mission, briefing, or other official duty (including civilian work for ARC crew members) and ends when engines are shut down at the end of the mission, mission leg, or a series of missions. Maximum FDP is 16+00 hours for a basic aircrew and 20+00 hours for an augmented aircrew.

3.6.1.1. The basic FDP is 16 hours providing no mission events, helicopter air refueling (HAAR) below 3,000 feet AGL, pilot proficiency training, or functional check flights (FCF) are accomplished after 12 hours and no Air Refueling or HAAR at or above 3,000 feet AGL after 14 hours. If the autopilot is not operational or its use is denied for more than 4 hours, the FDP will be 12 hours. If the autopilot fails after departure, continue to the next scheduled stop and then comply with the basic FDP limitations. ***EXCEPTION***: AFRC and ANG FDP is 16 hours for all mission events, FCF and pilot proficiency training missions originating from home station and space center launch and recovery support missions.

3.6.1.2. The augmented FDP is 20 hours for all Rescue HC-130s, providing no mission events, HAAR below 3,000 feet AGL, pilot proficiency training, or FCFs are accomplished after 16 hours and no Air Refueling events or HAAR at or above 3,000 feet AGL are accomplished after 18 hours. If the autopilot is not operational or its use is denied for more than 8 hours, the FDP will be 16 hours.

3.6.1.2.1. Crew changes should not be made immediately prior to performing critical phases of flight. Normally, 30 minutes prior to initiating the checklist for an event will allow the new crewmember time to get acclimated. ***EXCEPTION*****:** For training missions instructors will plan and brief crew changes to safely maximize training objectives.

3.6.1.2.2. Minimum in-flight crew rest facilities will be 3 bunks or litters.

3.6.1.2.3. FDP length will be based on the mission to be performed. For example, if the planned mission duration is 15 hours from show time to termination, then a basic

FDP is appropriate even if the crew is augmented. Once established, a basic FDP will not be changed to an augmented FDP, regardless of crew composition.

3.6.1.2.4. Time spent traveling as a passenger on commercial or military transportation in excess of 4 hours counts as part of the duty period. Official duty travel for personnel in official military/civilian status will count toward the duty period.

3.6.1.2.5. The PIC may extend the crew's FDP and/or CDP by up to 2 hours on a mission in progress. The PIC should attempt to comply with the waiver authority in AFI 11-202V3. If this option is exercised, the PIC must coordinate with command and control agencies so that downstream activities are not adversely affected. Missions will not be scheduled to exceed the maximum FDP in this paragraph. PICs must carefully weigh all factors affecting their crew before electing to extend the flight duty period.

3.6.2. Crew Duty Period (CDP). CDP is the period that starts when an aircrew reports for a mission, briefing, or other official duty (including civilian work for ARC crew members) and ends at the completion of aircrew duties at the aircraft. Maximum CDP is 18+00 hours for a basic aircrew and 22+00 hours for an augmented aircrew.

3.6.3. Rescue Alert Procedures. Rescue alert duty is defined as any period during which an alert crew is on call to perform a specific mission. Aircrew will be placed into crew rest prior to alert status. Upon entering crew rest, an aircrew will be given an expected alert assumption time. Rescue alert aircrews must be prepared to respond at any time during the alert period.

3.6.3.1. Alert personnel are those required to be on duty for the prompt execution of the mission. Alert crews will be readily available in a location which allows the crew to meet the required time to launch from notification. Suitable facilities include adequate sleeping accommodations for the entire crew, unless at home station.

3.6.3.2. The alert duty period will begin at a scheduled time determined by the unit/mission commander. Provide aircrew members an inviolate 12 hours crew rest prior to alert duty. The unit/mission commander will determine the normal length of the alert period, not to exceed 72 hours. An alert period may be extended up to a maximum of 7 days with MAJCOM/A3 (or deployed equivalent) approval provided aircrew members receive a 24-hour recovery period prior to the next alert.

3.6.3.3. The crew duty period will begin when the aircrew shows for flight duties. Crews may complete initial alert activities (e.g., transportation, briefing, preflight, engine run of their alert aircraft) without starting their crew day. This time should not exceed 3 hours. Alert response exercises that terminate prior to engine start do not start crew duty time when they occur during normal waking hours.

3.6.3.4. A daily update briefing may be accomplished without starting crew duty time. This brief can include weather, local NOTAMS, latest FCIF information, special instructions, and any other appropriate items. The PIC determines which crewmembers attend the brief.

3.6.4. **Non-Rescue Alert Procedures**. **(T-1)** PIC shall establish a legal for alert time based on aircraft availability and mission requirements, as appropriate. If the crew is not alerted within 8 hours (e.g. due to aircraft availability, mission delays, etc.), the PIC will return the crew to crew rest and establish a new legal for alert time. OG/CC will define alerting procedures for local training missions in **Chapter 10**, Local Operating Procedures. Provide a minimum of 2 hours (except ARC at home station) from arrival at aircraft to stations time for crewmembers to complete preflight duties (if not previously preflighted).

3.6.5. Flying the Alert Crew:

3.6.5.1. If the alert crew is launched and returns with FDP remaining, they may be launched again within the constraints of that crew day. Numerous circumstances may arise that affect the decision to replace the alert crew and each incident must be evaluated on an individual basis.

3.6.5.2. The alert crew will not normally be used as a "preflight" or "engine run" crew for aircraft other than their alert aircraft. Alert crews will not perform other official duties (e.g., additional duties, commander's call, safety meeting, etc.) within their alert period. ***EXCEPTION***: During normal waking hours, alert aircrew may mission plan at the discretion of the PIC.

3.6.5.3. An alert crew should not remain in alert status for more than 2 consecutive 72-hour alert periods. The crew will receive 12 hours of premission crew rest between the first and second alert periods. Following completion of the second 72-hour alert period, the crew or crewmember will receive a minimum of 24 hours crew rest prior to reassuming alert status.

3.6.6. Flying Crew Chief Work and Rest Plan. The crew chief is responsible to the PIC. The PIC, after consulting with the home station chief of maintenance (or deployed equivalent), will determine how long the crew chief can safely perform aircraft recovery actions. The crew chief must have the opportunity to sleep 8 hours in each 24-hour period. See AFI 21-101, *Aircraft and Equipment Maintenance Management*, for detailed guidance.

3.6.7. TDY Crew Rest/Post Deployment Stand Down.

3.6.7.1. All primary and deadhead crewmembers departing on missions scheduled to be away from home station or rotational base for more than 16 hours or recover away from home station should be notified 24 hours before reporting for the mission. The first 12 hours are not considered crew rest, but are designed to allow crewmembers time to resolve personal affairs. During these first 12 hours, a crewmember may perform limited non-flying duties. The second 12 hour period is inviolate crew rest (ARC will comply with AFI 11-202V3 as supplement).

3.6.7.2. Postmission crew rest begins upon the final return of an individual to home station and runs continuously until completed. Postmission crew rest must be completed before starting the 12 hour predeparture crew rest period for a subsequent mission. Do not require a crewmember to get immunizations, engage in ground training, perform standby or squadron duties, or perform any other activity which would encroach upon crew rest. Waiver authority for postmission crew rest is the OG/CC. Waiver requests for postmission crew rest are considered on a case by case basis only with the concurrence of the individual crewmember. Compute post-TDY crew rest at the rate of 1 hour off for every 3 hours of TDY, not to exceed 72 hours. ***EXCEPTION:*** Not applicable to ARC and to students in formal schools listed in AFCAT 36-2223, *USAF Formal Schools*.

3.6.7.3. Post Deployment Stand Down. IAW AFI 10-403, *Deployment Planning and Execution,* and all applicable MAJCOM supplements.

# Chapter 4

# COMMAND OPERATING GUIDELINES

**4.1. Objectives. (T-1)** The ultimate objective of the aircraft maintenance team is to provide an aircraft for launch with all equipment operational, Fully Mission Capable (FMC). Manpower limitations, skills, and spare part availability have a negative and direct impact on accomplishment. However, under specific circumstances, some missions can be safely operated without all equipment being operational. Using the following policies, the PIC is the final authority in determining an overall status of an aircraft. Use the following maintenance identifiers to effectively communicate a status of an aircraft:

4.1.1. Mission Essential (ME). An item, system, or subsystem component essential for safe aircraft operation or mission completion will be designated Mission Essential (ME) by the PIC in AFTO Form 781A, **Maintenance Discrepancy and Work Document**. Include a brief explanation of the reason for ME status in the AFTO Form 781A discrepancy block. A PIC accepting an aircraft (one mission or mission segment) without an item or system does not commit that PIC (or a different PIC) to subsequent operations with the same item or system inoperative.

4.1.2. Mission Contributing (MC). Any discrepancies not currently ME, but may become ME (if circumstances change), are designated as MC in the AFTO Form 781A discrepancy block. Every effort will be made to clear the MC discrepancies at the earliest opportunity as maintenance skills, ground time, and spare part availability permit. If subsequently, in the PIC's judgment, mission safety would be compromised by the lack of any component, he/she may redesignate the said discrepancies/component as ME. However, do not delay a mission to correct an MC discrepancy.

4.1.3. Open Item. Discrepancies not expected to adversely impact the current mission or any subsequent missions are not designated MC or ME. These items receive low priority and are normally worked at home station. Do not accept an aircraft from factories, modification centers, or depots unless all instruments are installed and operative.

4.1.4. If the PIC elects to operate with degraded equipment or aircraft systems, coordinate mission requirements (e.g., revised departure times, fuel requirements, maintenance requirements, etc.) prior to flight with the mission control agency to ensure the decision does not adversely impact follow-on missions. For Air National Guard (ANG) or Air Force Reserve Command (AFRC) aircraft on ANG or AFRC mission identifiers, coordinate through the Air National Guard Operations Center (NGB/A3YC) or Air Force Reserve Command Center (HQ AFRC/A3OC).

**4.2. Policy.** This chapter provides guidance on minimum equipment requirements and operating with degraded equipment.

**4.3. Waiver Protocol. (T-1)** Waivers to operate with degraded equipment are granted on a case-by-case basis. The PIC determines the need for a waiver after coordinating with the lowest practical level of command. MEL waiver authority is as follows:

4.3.1. Training Missions. OG/CC or equivalent with mission execution authority.

4.3.2. MAJCOM Directed Missions. MAJCOM/A3 with mission execution authority for RegAF and ARC units flying MAJCOM-directed missions (includes Unit Effectiveness Inspections). Initiate the request with MAJCOM C2 agency.

4.3.3. Contingency Missions. COMAFFOR (or equivalent) for the agency with C2, if not specified in the OPORD/Tasking Order.

4.3.4. ARC Directed Missions. ARC maintains C2 and waiver authority for ARC directed mission prior to mobilization.

4.3.5. Determine governing source document (i.e. AFI, Flight Manual, Maintenance T.O., etc.) to ascertain the waiver authority. Use C2 channels to notify the appropriate waiver authority. Waivers of this nature may require an extended response time.

**4.4. HERP Procedures.** For hostile environment repair procedures, reference AFSOCM 11-201, *Hostile Environment Repair Procedures*. See **Chapter 12** for additional guidance.

**4.5. Deviations and Technical Assistance Service.** At any time in the decision process, the PIC may request technical support and additional assistance from their home unit, MAJCOM staff, and maintenance representatives.

4.5.1. A PIC electing to operate with degraded equipment or aircraft systems (with appropriate waiver) must coordinate mission requirements (i.e., revised departure times, fuel requirements, maintenance requirements, etc.) with the controlling C2 agency before flight.

4.5.2. If beyond C2 communication capability, or when it is necessary to protect the crew or aircraft from a situation not covered by the AFI and immediate action is required, the PIC may deviate from this chapter according to **paragraph 1.3** Aircrew should report deviations (without waiver) through channels to appropriate MAJCOM/A3 within 48 hours. Units must be prepared to collect background information and submit a follow-up written report upon request.

**4.6. Command Operating Guidelines. (T-1)**

4.6.1. Except as listed in the guidance of this chapter, aircraft will not depart if any equipment required to execute flight manual emergency procedures is inoperative. **Table 4.1** lists minimum equipment requirements and is provided to serve as a quick reference guide for the PIC to determine required equipment. Unless specifically referenced in the remarks or elsewhere in this chapter, the PIC will determine equipment required to accomplish a given mission. The PIC is expected to develop, and is empowered to use, prudent RM analysis based on mission, environment, threat, aircraft systems, and aircrew qualification when determining required equipment for safe mission accomplishment. ***NOTE:*** For any instrument that presents both analog and digital information, either presentation is acceptable at the PICs discretion.

**Table 4.1. Minimum Equipment Requirements.**

| **Item/System** | **Installed** | **Required** | **Remarks/Limitations/ Exceptions** |
|---|---|---|---|
| Landing Lights | 2 | 1 | Required IAW AFI 11-202V3 |

| | | | |
|---|---|---|---|
| Airspeed Indicator | 2 | 2 | Required IAW AFI 11-202V3 |
| Air Deflector Doors | 2 | 0 | Dependent on mission requirements |
| Antiskid | 1 | 1 | Reference **paragraph 4.6.6.** |
| Attitude Direction Indicator (ADI) | 2 | 2 | Required IAW AFI 11-202V3 |
| APU/ATM | 1 | 0 | Required for unrestricted flight. If the system is inoperative, flight in day VMC is permissible provided no other electrical malfunction exists. |
| Barometric Altimeters | 3 | 2 | Both pilots' altimeters must be operational. |
| Central Air Data Computer | 1 | 1 | HC-130(H)N |
| Cockpit Voice Recorder (CVR) | 1 | 0 | The CVR will be operational for all departures unless parts are not available on station to repair the unit. |
| Compass Systems | 2 | 1 | See **paragraph 4.8.1.** |
| Complete Fault Indications (Off Flags) | | | Required IAW AFI 11-202V3 |
| Enhanced-Traffic Alert and Collision Avoidance System (ETCAS) | 1 | 0 | Refer to FLIP for country/airspace specific requirements. |
| Flight Director System | 2 | 1 | One flight director plus ADI repeat satisfies the requirement. |
| Fuel Flow Gauges | 4 | 4 | |
| Ground Collision Avoidance System (GCAS) | 1 | 1 | Required for tactical low level operations (to include objective area operations) |
| High Frequency Radio | 2 | 0 | Mission dictates requirement. One required for over water flight |
| Horizontal Situation | 2 | 2 | Required IAW AFI 11-202V3 |

| | | | |
|---|---|---|---|
| Indicator | | | |
| IFF/SIF | 1 | 1 | Reference **paragraph 6.24.** |
| Low Oil Quantity Light | 1 | 0 | If inoperative, all four oil quantity gauges must be operative |
| Oil Cooler Flap | 4 | 4 | Oil cooler flaps may be open and fixed as long as normal oil temperature can be maintained. |
| UHF Manual Control Head | 1 | 1 | |

4.6.2. Pressurization and Air Conditioning Systems. Pressurization and both air conditioning systems should be operational if patients are carried. If a system fails at an en route stop, the mission may continue (coordinate with the senior medical crewmember when patients are carried) to a destination with repair capability. Required en route stops are authorized. The PIC will ensure passengers and patients are briefed on the possibility that discomfort may be encountered. Air conditioning/pressurization systems are not required for low level missions if a reasonable temperature can be maintained.

4.6.3. Electrical System:

4.6.3.1. All engine AC generators for all C-130s should be operational prior to departure. If a generator fails at an en route stop, the mission may continue to a destination with repair capability. Required en route stops are authorized. If the AC generator is not equipped with a disconnect, it will be removed and the generator mount padded before flight. Local training and contingency missions may continue after a generator is disconnected or removed and the mount padded, provided no other electrical malfunctions exist.

4.6.3.2. An operative ATM or APU generator is required for unrestricted flight. If the system is inoperative, flight in day visual meteorological conditions (VMC) is permissible provided no other electrical malfunction exists. The generator of the HC-130(H)N will be removed and padded prior to operation of the APU.

4.6.4. Fuel System. The primary concern with inoperative fuel boost pumps or quantity indicators is fuel balance and wing loading. Degraded operation is permissible; however, flight crews must consider potentially trapped fuel and decreased range, should further degradation occur. The following paragraphs provide guidelines for degraded fuel system operations under most circumstances.

4.6.4.1. One pump must be operable for each external tank containing fuel.

4.6.4.2. One main tank fuel indicator may be inoperative. Two main tank indicators may be inoperative provided they are not symmetrical tanks or on the same wing.

4.6.4.2.1. Verify the tank with the inoperative indicator and its symmetrical tank quantity using a fuel tank dip stick. ***NOTE:*** Ensure maximum outboard main tank fuel weight is not exceeded when stores of any kind are installed on the outboard wing (e.g., refueling pods).

4.6.4.2.2. At en route stops when engines are shut down, dip check the tank with the inoperative indicator and the symmetrically opposite tank.

4.6.4.2.3. Start crossfeed operation when any main tank decreases to 2,000 pounds.

4.6.4.2.4. Engine out training using the engine corresponding to the inoperative indicator or its symmetrically opposite will not be conducted during tank to engine operation.

4.6.4.2.5. Maintain symmetrical engine fuel flow.

4.6.4.2.6. Plan to terminate flights with a minimum of 8,000 pounds calculated main tank fuel.

4.6.4.3. One external fuel tank indicator may be inoperative provided both external fuel tanks are checked full or empty. Both external fuel tank indicators may be inoperative provided both external tanks are checked empty. When an external tank indicator is inoperative and the tank cannot be visually checked empty due to foam modification, comply with the following prior to flight:

4.6.4.3.1. Check pressure with each pump in the external tank. If no pressure is obtained, the tank is verified empty.

4.6.4.3.2. If pressure is obtained, transfer the fuel from the external tank. Defuel the external tank if unable to ground transfer.

4.6.4.3.3. When unable to verify an external tank is empty prior to engine start, place the tank on crossfeed until no pressure is obtained. This will be completed prior to takeoff.

4.6.4.3.4. HC-130 aircraft with two external fuel tank indicators inoperative may fill external tanks to maximum providing fuel is ground transferred to a fuselage tank with an operable fuel quantity indicator; ground transfer from only one tank at a time. Transfer no more than 1,000 pounds at a time between an external tank with an inoperative indicator and the fuselage tank to maintain fuel balance.

4.6.4.4. Both auxiliary tank indicators may be inoperative provided auxiliary fuel quantity is verified.

4.6.4.5. Both a main and external fuel tank indicator may be inoperative on the same wing provided steps in **paragraphs 4.6.4.2** and **4.6.4.3**. are followed.

4.6.4.6. For other than normal ground refueling/defueling operations and associated guidelines per this chapter, fuel will not be transferred into or out of a main or external fuel tank with an inoperative indicator or its symmetrical tank except per **paragraph 4.6.4.3.4** and the following:

4.6.4.6.1. Fuel transfer into a main or external tank with an inoperative indicator may be accomplished during contingency or emergency fuel need situations. All transfers, under these conditions, will be coordinated verbally and visually with the pilot/copilot as a backup for lateral wing balance.

4.6.4.6.2. A reliable source of known quantity transferred must be available. This source can be either the (AR) gage readings or internal aircraft operating fuel quantity indicators.

4.6.4.6.3. Maintain symmetrical tanks within 1,000 pounds at all times. If small amounts (4,000 pounds or less) must be transferred, then transfer up to 1,000 pounds into the tank with the inoperative indicator followed by an equal amount into the tank(s) with operative indicator(s). If large amounts of fuel must be transferred, then transfer 1,000 pounds into the tank with the inoperative indicator, then up to 2,000 pounds as needed into the tank(s) with the operative indicators, then up to 1,000 pounds as needed into the tank with the inoperative indicator to bring all tanks symmetrical, or continue up to 2,000 pounds as needed, repeating the cycle until desired fuel quantity and balance is achieved in applicable tanks.

4.6.4.6.4. Fuselage tank with an inoperative indicator. The flight engineer will verify the fuselage tank empty by utilizing the boost/dump pumps to transfer out of the tank until tank empty light illuminates. ***WARNING*****:** Do to the possibility of fuel fumes/leaking into the cargo compartment do not verify the fuselage tank full via the internal refueling cap.

4.6.4.7. Fuel may be transferred from main or external tanks with inoperative indicators only if the receiver requires emergency fuel. In this situation, the following procedures will apply:

4.6.4.7.1. The fuel counter for the refueling pod being used must be operational to track the amount of fuel transferred.

4.6.4.7.2. Transfer from only one tank at a time.

4.6.4.7.3. Transfer no more than 1,000 pounds at a time between the tanks with the inoperative indicator and its symmetrical tank to monitor fuel balance.

4.6.5. Antiskid System:

4.6.5.1. The antiskid may be inoperative for flight to a destination with repair capability. Required en route stops are authorized. The mission is restricted to one termination landing per sortie.

4.6.5.2. A local training flight may continue once airborne if the antiskid fails provided the system is turned off. The mission is restricted to one termination landing.

4.6.5.3. Maximum Effort operations are not authorized with antiskid inoperative.

4.6.6. Landing Gear System**.** If a landing gear malfunction is encountered, only a full stop landing will be made. The discrepancy will be corrected prior to the next flight. ***EXCEPTION*****:** If repair capability does not exist and a positive determination is made that further flight can be accomplished with the gear down and locked, the aircraft may be flown to a destination where repair capability exists provided the gear is not moved from the down and locked position. Required en route stops are authorized.

4.6.6.1. PICs should notify appropriate CC prior to flying with landing gear down and locked.

4.6.7. Doors and Ramp System:

4.6.7.1. Aircraft will not depart on a pressurized flight unless the door warning light system for the cargo ramp is operative.

4.6.7.2. Aircraft will not be flown with a crew entrance door or crew entrance door warning light malfunction.

4.6.7.3. Aircraft will not be flown pressurized with a cargo ramp lock malfunction. Unpressurized flight may be authorized with a cargo ramp lock malfunction when mission requirements dictate.

4.6.8. Radar. Weather mode radar must be operative for flights into areas of known or forecast thunderstorms.

4.6.9. Cockpit Voice Recorder (CVR). The CVR will be operational for all departures unless parts are not available on station to repair the unit. Passengers will not be flown without an operative CVR. If involved in a mishap or incident, after landing and terminating the emergency, pull the CVR power circuit breaker.

**4.7. Supplements.** MAJCOMs may supplement **Table 4.1** IAW **Chapter 1**.

**4.8. Navigation Systems.**

4.8.1. Compass systems. Both compass systems should be operational. If one system fails, refer to the flight manual to determine what other equipment is affected. Two independent sources of heading, i.e., one C-12 compass and one aligned inertial system are required. The C-130 standby compass is not considered a separate source for the purposes of this paragraph.

4.8.2. For flights in Minimum Navigation Performance Specification (MNPS) airspace in the North Atlantic Region a fully operational SCNS, to include the navigator's, pilot's, and copilot's IDCUs, is required. Equipment listed in FLIP AP/2 for permitting compliance with MNPS is mandatory. Loss of any component before track entry requires return to a station with maintenance capability or re-filing via specified routes.

4.8.3. For flights on all other Category I routes, the PIC determines the minimum navigational capability required to safely accomplish the mission. Consider the following: length and route of flight, weather, and experience and proficiency of the crew.

4.8.4. Basic Area Navigation (BRNAV) Airspace. HC-130 aircraft are approved for BRNAV operations. BRNAV navigation accuracy criteria is RNP-5. Pilots will immediately notify ATC if any of the required equipment fails after entry into BRNAV airspace and coordinate a plan of action. Document in the aircraft forms malfunctions or failures of RNP required equipment.

4.8.4.1. BRNAV operations require at least one fully operational INS system.

4.8.4.2. The Maximum time limit for BRNAV operations is 9.6 hours. This time limit is contingent on performing a medium accuracy alignment of the aircraft INU. Once the time limit is reached, the aircraft must perform a ground based realignment of the INU in order to maintain compliance with and continue flight in BRNAV airspace.

4.8.4.3. While operating in civil-controlled airspace, the aircraft must be flown in INS-only and with the autopilot engaged.

**4.9. HC-130P aircraft exceeding 38,000 Equivalent Baseline Hours (EBH). (T-1)** In addition to flight manual restrictions, aircrews will adhere to the following training restrictions when operating HC-130P aircraft that have reached 38,000 EBH. Aircraft inspected and repaired IAW *TCTO 1C-130-1908* are not restricted.

4.9.1. The following restrictions apply:

4.9.1.1. Do not exceed 190 KIAS below 3,000 feet AGL.

4.9.1.2. Flight is prohibited when turbulence is forecasted or reported to be moderate or greater.

4.9.1.3. Flight is prohibited below 3,000 feet AGL in mountainous terrain when the winds are forecasted or reported to exceed 35 knots in the low level environment (below 3,000 feet AGL). This applies to areas of transition (takeoff or landing) and operations below the crests of any ridgeline within 50 NM.

4.9.1.4. Crews will not conduct search patterns or rescue airdrop patterns in mountainous terrain if winds exceed 15 knots at an altitude that is 1,000 feet above the intended rescue airdrop/search pattern altitude or 1,000 feet above the crest of any ridgeline within 20 NM, whichever is higher.

4.9.1.5. The following maneuvers are prohibited regardless of altitude: Threat maneuvering and tactical recoveries. ***EXCEPTION***: self-contained approaches (straight-in or closed pattern).

4.9.2. The OG/CC may waive these restrictions when the use of a restricted HC-130P is required for operations contingencies (does not apply to the restrictions listed in the flight manual).

4.9.3. Crews should minimize aircraft exposure time during low-level operations. It is recommended not to exceed 30 degrees of bank with any flap extension and 50 degrees of bank with a clean configuration.

# Chapter 5

## AIRLAND OPERATIONS

**5.1. Aircraft Maximum Gross Weight Policy.** Aircraft maximum gross weight is 155,000 pounds. Waiver authority for operations above 155,000 pounds is MAJCOM/A3T (A3J for ACC, AFRC/A3 for AFRC and NGB/A3 for NGB) or deployed equivalent. For Overload Gross Weight, the maximum waiverable gross weight is 175,000 pounds. ***NOTE*****:** AFRC/A3 delegates the waiver authority for AFRC HC-130 operations above 155k up to 165k to the WG/CC.

**5.2. Takeoff and Landing Policy (T-1):**

5.2.1. The pilot in command (PIC) will occupy either the left or right seat during all takeoffs and landings.

5.2.2. Instructor and flight examiner pilots may takeoff or land from either seat under any condition.

5.2.3. An AC qualified pilot may make takeoffs and landings from either seat. Comply with **paragraphs 5.3** and **5.4**

5.2.4. An AC qualified pilot will land from the left seat during:

5.2.4.1. Aircraft emergencies, unless conditions prevent compliance.

5.2.4.2. Maximum effort or substandard airfield operations. Evaluators, instructors and instructor upgrade students may land from the right seat for training, currency, or proficiency.

5.2.4.3. Missions operating in areas of hostile activity. For units operating in defined combat zones, squadron commanders may authorize AC qualified pilot or flight pilot/copilot landings from the right seat at specific airfields.

5.2.4.4. Arrival and departure at airfields that require group commander or deployed equivalent approval as indicated in **paragraph 5.20** Flight examiner and instructor pilots may perform or demonstrate takeoffs and landings from either seat into certification airfields specified in the HQ AMC Airfield Suitability and Restrictions Report (ASRR).

5.2.4.5. ACs who possess less than 100 hours in C-130 aircraft since initial upgrade will make all takeoffs and landings from the left seat. ***EXCEPTION*****:** Any AC may perform takeoffs and landings from the right seat with a less than 100 hour AC in the left seat when required for currency.

5.2.4.6. NVG Airland current and qualified ACs may accomplish NVG landings (non-short field/non-maximum effort) from the right seat provided that the left seat pilot is an NVG Airland current and qualified AC or higher.

**5.3. MPD Trained Copilot Landing Policy. (T-1)** Except as specified in **paragraph 5.2**, MPD Pilots may takeoff or land:

5.3.1. From either seat if an instructor or flight examiner occupies the other seat.

5.3.2. From either seat if the PIC has accumulated at least 100 hours in command in the C-130 since initial upgrade to AC.

5.3.3. From the right seat using NVGs for non-short field/non-maximum effort operations provided they are current and qualified and a current mission qualified AC occupies the left seat.

**5.4. Legacy Trained Copilot Landing Policy. (T-1)** Except as specified in **paragraph 5.2**, and provided no patients or DV4 or higher are on board, copilots may takeoff or land:

5.4.1. From either seat if an instructor or flight examiner occupies the other seat.

5.4.2. From the right seat if the PIC has accumulated at least 100 hours in command in the C-130 since initial upgrade to AC.

5.4.3. From the right seat using NVGs for non-short field/non-maximum effort operations provided they are current and qualified and a current mission qualified AC occupies the left seat. Legacy copilots must be qualified for right seat NVG airland operations IAW MAJCOM approved syllabus or training plan. Following qualification, right seat NVG airland events will become a currency requirement and required evaluation event for periodic mission evaluations.

**5.5. Landing Gear and Flap Operation (T-1).**

5.5.1. The pilot in the right seat will operate the landing gear. Actuate the landing gear only after command of the pilot flying (PF) the aircraft. Prior to actuation of the landing gear, the other pilot will acknowledge the command by repeating it. ***EXCEPTION:*** Not required during Infil/Exfil checklist.

5.5.2. The PIC may assign flap operation to either the PM or the FE. Operate the flaps only after the command of the PF. Prior to operating the flaps, acknowledge the command by repeating it.

**5.6. Use of Outside Observers.** To the maximum extent possible, crewmembers should assist in scanning/clearing outside during all taxi operations and in-flight during arrivals and departures below 10,000 ft. MSL duties permitting.

**5.7. Seat Belts. (T-1)** Crewmembers occupying either the pilot, copilot, or flight engineer seat will have seat belts fastened at all times.

5.7.1. All occupants will be seated with seat belts fastened during taxi, takeoff and landing. ***EXCEPTION*:** Flight examiners, instructors, mission commanders, crewmembers performing scanner duties, outside observers during taxi, flight engineers, medical personnel, and loadmasters performing required duties are exempt; however, they will have a designated seat (spot for combat loading procedures) and required restraint available.

5.7.2. Provide a safety belt for all occupants over 2 years of age. Occupants will fasten seat belts securely when turbulence is encountered or anticipated, or in areas of forecast clear air turbulence.

5.7.3. Floor loading is authorized to support dedicated U.S. forces and foreign counterparts during operations, exercises, and training. The PIC will ensure personnel are secured with a cargo strap during floor loading operations.

**5.8. Aircraft Lighting:**

5.8.1. For single ship, non-tactical operations refer to AFI 11-202V3, *General Flight Rules*. Use taxi lights during all taxi operations. ***EXCEPTION*:** When taxi lights have IR lens covers installed, use the landing lights instead. Use landing lights at night in unlit areas. Use taxi lights in-flight any time the landing gear is extended, unless reflections cause pilot distractions. Formation and leading edge lights should be on during operations below 10,000 feet AGL. Landing lights may be used continuously during local traffic pattern training and low altitude maneuvering in high-density traffic areas.

5.8.2. NVG operations may dictate that external lights are turned off or IR lenses are installed. Conduct training operations with reduced or no external lighting within the confines of designated restricted areas, warning areas. Lights out operations in MOAs may be conducted IAW AFFSA ACC waiver Vol 3/20031.

**5.9. Advisory Calls. (T-1)** The PF will announce intentions for departures, arrivals, approaches, and when circumstances require deviating from normal procedures.

5.9.1. Any crewmember seeing a deviation of 200 feet altitude or 10 knots in airspeed, or a potential terrain or obstruction problem, will immediately notify the PF. Deviations from prescribed procedures for the approach being flown will also be announced.

5.9.2. **Tables 5. 1** through **Table 5.4** depict mandatory calls for takeoff, climb out and descent, non-precision and precision approaches.

**Table 5.1. Takeoff.**

| Phase of Flight | PM Call | PF Response |
|---|---|---|
| Takeoff – prior to refusal speed | "Reject" (Note 1) | |
| At refusal speed | "Go" (Note 2) | |
| At rotation speed | "Rotate" (Note 2) | |
| ***NOTES:***<br>(1) Prior to Refusal Speed, any crewmember noting a safety of flight condition/malfunction will state "Reject" and give a brief description of the malfunction.<br>(2) If takeoff and refusal speeds are equal then state "Go." | | |

**Table 5.2. Climb Out and Descent.**

| Phase of Flight | PM Call | PF Response |
|---|---|---|
| On climb out, at Transition Altitude | "Transition Altitude, Altimeter Set 29.92." | State Altimeter |
| On climb out, 1,000 feet below assigned altitude or flight level | "1,000 Below" | |

| | | |
|---|---|---|
| On descent, at Transition Level | "Transition Level, Altimeter Set (local setting)" | State Altimeter |
| On descent, 1000 above assigned altitude/flight level, initial approach fix, or holding altitude | "1,000 Above" | |
| ***NOTE:*** All crew positions who can change the altimeter setting will state the new setting. | | |

**Table 5.3. Non-Precision Approach.**

| Phase of Flight | PM Call | PF Response |
|---|---|---|
| 100 feet above final approach fix altitude, stepdown fix altitude(s), and minimum descent altitude (MDA) | "100 Above" | |
| at MDA | "Minimums" | |
| Runway environment in sight | "Runway in sight." | |
| At Missed Approach Point | "Missed Approach Point" | State intentions [Note] |
| ***NOTE:*** The PF will announce his/her intentions to either land or go-around. | | |

**Table 5.4. Precision Approach.**

| Phase of Flight | PM Call | PF Response |
|---|---|---|
| At one hundred feet above glide slope intercept altitude or decision height (DH) | "100 Above" | |
| At DH with only the approach lighting system is in sight and the aircraft is in a position to safely continue the approach | "Continue." [Note 1] | "Continuing" or<br>"Going-Around" |
| At DH- runway is in sight and the aircraft is in position to execute a safe landing. | "Land." | "Landing" or<br>"Going Around" |
| At DH - runway environment is not in sight or if the aircraft is | "Go Around." | "Going Around" |

| | | |
|---|---|---|
| not in position to execute safe landing. | | |
| At 100' Above TDZE | "100 Feet" [Note 2] | State intentions [Note 3] |

***NOTES:***

(1) With weather at CAT I minimums on a CAT I ILS, the pilot may not see the runway environment at DH; however, the initial portion of the approach lights may be visible. The pilot may continue to 100 HAT with reference to the approach lights only. The pilot may not descend below 100 feet above touchdown zone elevation using the approach lights as reference unless the red terminating bars or the red side row bars are distinctly visible and identifiable.

(2) If the PF has stated "landing" then this call is not required.

(3) The PF will announce his/her intentions to either land, or go-around.

**5.10. Wind Limitations.** Maximum crosswind limits are in accordance with flight manual limitations. All maximum effort operations and simulated engine out landings (one or two engine inop) must fall within the 'recommended' area unless otherwise approved by the OG/CC, or COMAFFOR for contingency/expeditionary operations when units experience a change of operational control.

**5.11. RCR and RSC.** Reference *T.O. 1C-130(MDS)-1-1* and *AFTTP 3-3.HC-130.*

5.11.1. The runway surface should be considered wet when water on the runway causes a reflective glare. The RCR values listed in **Table 5.5** are estimates based on operational experience and should be used only as a guide.

**Table 5.5. RCR Values.**

| **TYPE SURFACE** | **RCR (DRY)** | **RCR (WET)** |
|---|---|---|
| Asphalt | 23 | 12 |
| Aluminum Matting | 20 | 10 |
| M8A1/With Anti-Skid (PSP) | 20 | 8 |
| M8A1/Without Anti-Skid (PSP) | 13 | 3 |
| Clay | 16 | 5 |
| Crushed Rock | 16 | 5 |
| Coral | 16 | 4 |

5.11.2. Limit C-130 operations into and out of slush or water covered runways to a covering of one inch. This number is based on performance charts where an RSC of 10 is equal to one inch of slush or water. Performance data where more than one inch of slush or water is present may not be accurate.

**5.12. Wake Turbulence Avoidance. (T-1)** Comply with wake turbulence avoidance criteria. Acceptance of traffic information, instructions to follow an aircraft, or a visual approach clearance is acknowledgment that the PIC will ensure takeoff and landing intervals and accepts responsibility of providing wake turbulence separation. Refer to FLIP GP for more information concerning wake turbulence separation.

**5.13. LZ Markings.** LZ markings may vary depending upon the supporting agency. Refer to AFI 13-217, *Drop Zone and Landing Zone Operations*. The markings to be used must be established during mission planning and included in the aircrew briefing.

**5.14. Aircraft Rescue Fire Fighting Requirements (ARFF).** ARFF requirements are as follows:

5.14.1. Up to four takeoffs and landings within 7 consecutive days may be accomplished at a Landing Zone (LZ) or airfield without ARFF (T-1). This is an airfield restriction. Each Group/Wing should track landing totals at airfields under their control. If landing totals are not tracked at airfields owned/controlled by other agencies, Wing/Group current ops will track landings to ensure the restriction is not exceeded for assigned aircraft (T-1).

5.14.2. For more frequent operations at an LZ or airfield, refer to AFPAM 32-2004, *Aircraft Fire Protection for Military Operations Other Than War*, and AFI 13-217 to calculate ARFF requirements. ***NOTE:*** Non-USAF ARFF vehicles may be used if the agent and pumping capabilities are equivalent.

5.14.3. Waivers to the ARFF requirements will be considered on a case-by-case basis. Required information for waiver request can be found in AFPAM 32-2004 and AFI 13-204V3, *Airfield Operations Procedures and Programs*.

**5.15. Runway and Taxiway Requirements (T-1).** Use normal takeoff and landing procedures whenever practical. All speeds and distances will be computed "without nose wheel steering." For mission accomplishment the PIC may authorize "with nose wheel steering" corrections IAW performance manual guidance.

5.15.1. Normal Operations. Minimum runway width is 80 feet or 25 meters. Minimum taxiway width is 30 feet or 9 meters.

5.15.1.1. Takeoff. Minimum runway length is the greater of balanced or unbalanced critical field length.

5.15.1.2. Landing. Minimum runway length is landing distance plus the following corrections:

5.15.1.2.1. Runway Visual Range (RVR) less than 40 (3/4 mile) – add 1,000 feet.

5.15.1.2.2. RVR equal to or greater than 40 (3/4 mile) – add 500 feet.

5.15.1.2.3. If runway length available for landing is less than required by the previous criteria, crews may use landing ground roll plus 1,000 feet when approved by the squadron commander. In this case, you must ensure the landing touchdown is in the first 500 feet of the runway.

5.15.2. Short Field Operations. Minimum runway width is 60 feet or 19 meters. Minimum taxiway width is 30 feet or 9 meters.

5.15.2.1. Only mission qualified pilots may use short field procedures. For other than hard-surfaced runways or taxiways, the airfield must be listed in the ASRR as certified or have a current LZ survey. For contingency operations, waiver of this requirement resides with the mission tasking authority.

5.15.2.2. Takeoff. Minimum runway length is charted minimum field length for maximum effort takeoff (MFLMETO). If runway available is greater than MFLMETO, then correct for one-engine inoperative air minimum control speed in ground effect (Vmca). Takeoff will be made at Vmca or Vmeto, whichever is greater.

5.15.2.3. When obstacles are a factor, use actual maximum effort takeoff speed (1.2 x power-on stall speed) and climb out at maximum effort obstacle clearance speed (1.3 x power-on stall speeds).

5.15.2.4. If runway available is less than MFLMETO corrected for Vmca, use Vmeto. Pilot may choose to use runway remaining at Vmeto to accelerate toward Vmca. ***WARNING:*** Aircraft performance and obstacle clearance is based on obtaining, and then maintaining obstacle clearance speed as quickly as possible. Aircraft performance below obstacle clearance speed may not allow safe clearance of obstacles.

5.15.2.5. Landing. Minimum runway length is ground roll plus 500 feet.

5.15.2.6. Training:

5.15.2.6.1. Minimum runway length is 3,000 feet.

5.15.2.6.2. Compute landing performance with 2 engines in reverse, 2 engines in ground idle and full brakes.

5.15.2.6.3. Takeoff speed will be Vmca or Vmeto, whichever is greater.

5.15.2.6.4. Obstacle clearance speed will be actual maximum effort obstacle clearance speed, or 10 knots above takeoff speed, whichever is greater.

5.15.2.6.5. Climb until clear of the simulated obstacle at obstacle clearance speed used.

5.15.2.6.6. Squadron commanders may authorize the use of actual max effort speeds (takeoff and obstacle clearance) on a case-by-case basis.

5.15.3. NVG Operations: NVG normal and short field operations will be conducted IAW **paragraphs 5.15.1** and **5.15.2**, respectively. The following additional guidance applies:

5.15.3.1. Minimum runway length using max effort procedures is ground roll plus 500 feet if a 500 foot touchdown zone is clearly marked on the runway. If the touchdown zone is greater than 500 feet, or unmarked, minimum runway length is ground roll plus 1,000 feet. ***WARNING:*** On blacked out runways, a go-around point will be identified during route study.

5.15.3.2. For training, the minimum runway width is 100 feet or 30 meters when an NVG certified FP/CP lands from the right seat.

**5.16. Operations over Arresting Cables. (T-1)** Avoid landing on (touching down on) arresting cables (does not include recessed cables). If the aircraft lands on or before the cable, the crew will contact the tower to have the cable inspected.

5.16.1. Operations are authorized on runways where BAK-12 or similar systems are installed, with a minimum of eight tiedowns, without regard to the flight manual restriction on movement over arresting cables. The aircraft should cross the cable on runway centerline to avoid damage. When operating from runways equipped with other types of systems, or less than eight tiedowns, use sound judgment to avoid damage to the aircraft. Maintain appropriate backpressure on the aircraft yoke during taxi operations to reduce nose landing gear down force.

**5.17. Aircraft Taxi Obstruction Clearance Criteria:** Without wing walkers, avoid taxi obstructions by at least 25 feet; with wing walkers, by at least 10 feet. ***EXCEPTION*****:** Locally based aircraft may taxi within 10 feet of obstacles without a wing walker when fixed taxi routes are marked and the obstruction is permanent. Taxi routes must be used by the same model aircraft for which they were designed and in the specifically designed parking spots. Support equipment shall be located in appropriately designated areas (T-1).

5.17.1. Whenever taxi clearance is doubtful, use a wing walker. If wing walkers are unavailable, deplane a crewmember to ensure obstruction clearance.

5.17.1.1. Use low speed ground idle when practical. If foreign object damage (FOD) is a problem, the outboard engines may be shut down provided gross weight, taxiway conditions, and weather are favorable. Verify all sources of brake pressure before shutting down symmetrical engines.

5.17.1.2. After landing and clearing the runway, with the approval of the PIC, the loadmaster may open the aft cargo door and lower the ramp to 12 inches above horizontal to prepare for cargo offload or onload. Ensure all equipment, cargo, and passengers remain secured in the cargo compartment.

**5.18. Reverse Taxi. (T-1)**

5.18.1. The pilot will coordinate engine status/utilization with the flight engineer and taxi directions and signals with the loadmaster and marshaller prior to commencing reverse taxi operations.

5.18.2. Secure all cargo and ensure all passengers are seated.

5.18.3. Open the aft cargo door. Ramp will be a minimum of 12 inches above horizontal for taxi operations.

5.18.4. The loadmaster will be on the ramp in a position to direct reverse taxi, report any hazards, and provide the pilot with timely interphone instructions on turns, distance remaining, condition of the maneuvering area, and stopping point. ***CAUTION*****:** If a complete set of ground loading ramps or canary slides are installed, at least one must be removed to allow unobstructed vision from the cargo ramp while backing.

5.18.5. During reverse taxi operations, the pilot and loadmaster will ensure that visibility in the taxi area is sufficient to conduct safe taxi operations. Avoid taxi obstructions by at least 25 feet, even if using a wing walker.

5.18.6. Every effort will be made to avoid the need for reverse taxiing during icy or snowy conditions. If unavoidable, extreme caution will be exercised and reverse taxi movement will be stopped using throttle control if sliding occurs.

**5.19. Fuel Jettisoning. (T-1)** Fuel will not be jettisoned except in combat, contingency or emergency conditions missions requiring gross weight reduction. Fuel will not be jettisoned for mission convenience.

**5.20. Takeoff and Landing Obstruction Clearance Criteria (T-1):**

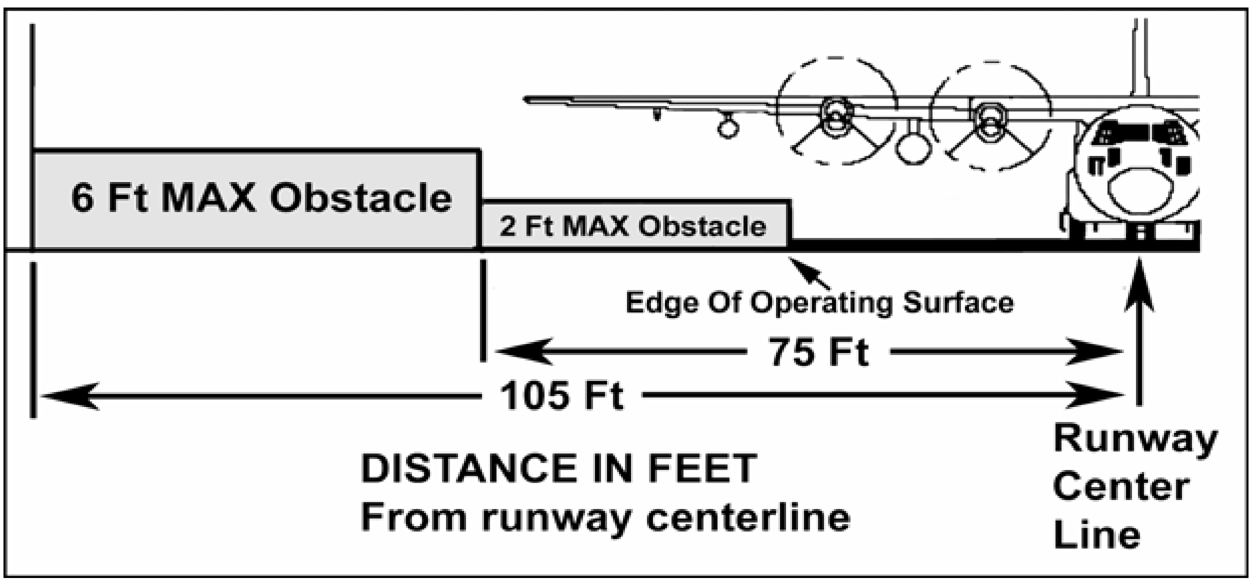
5.20.1. ASRR Certification Airfields. Aircraft commanders will not make an approach and landing into an airfield requiring certification by the ASRR unless they have operated into that airfield in the last two years as a pilot, flight pilot/copilot, or observer. See ASRR for certification requirements. Waiver authority for certification airfield restrictions is the OG/CC.

5.20.2. During ground operations comply with AFI 11-218, *Aircraft Operations and Movement on the Ground*. For contingency operations, the WG/CC may waive minimum obstructions clearances to those shown in **Figure 5.1** and **5.2** An airfield is considered suitable for C-130 operations when:

5.20.2.1. No obstructions penetrate outside the shaded area of **Figure 5.1** This ensures obstruction clearance only if the aircraft is maintained within 35 feet of runway centerline and the angle of bank does not exceed 5 degrees.

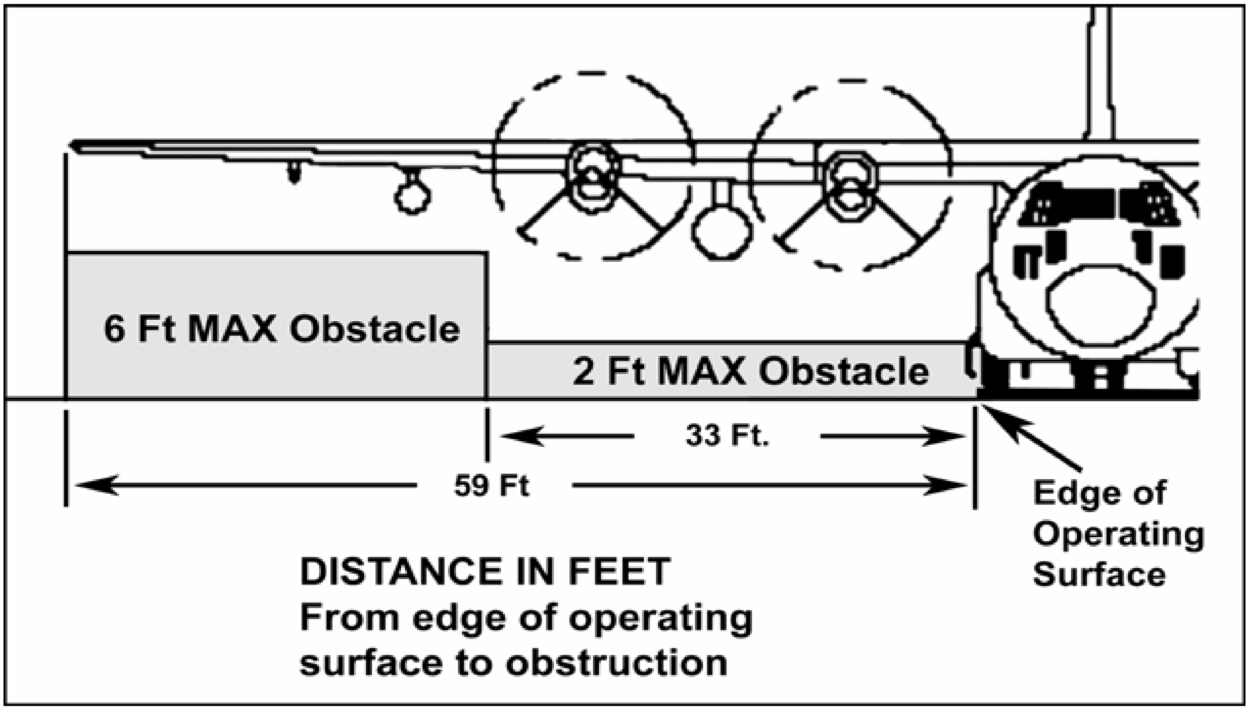
5.20.2.2. When an obstruction penetrates outside the shaded area of **Figure 5.1** specific approval by the wing commander or deployed equivalent is required and the AC must be advised of the height and location of the obstruction, as well as specific procedures to avoid the obstacle (i.e., landing beyond the obstacle).

**Figure 5.1. Obstruction Clearance Criteria.**




5.20.2.3. **Figure 5 2** Depicts minimum obstruction clearance criteria for ground operations with the main landing gear on the edge of the operating surface. ACs will be advised of any known obstructions that penetrate outside the shaded area.

**Figure 5.2. Minimum Obstruction Clearance Criteria For Ground Operations With The Main Landing Gear On The Edge Of The Operating Surface.**




**5.21. Buddy and Windmill Taxi Starts.** Buddy and windmill taxi starts may be performed when required by training syllabus or when approved by the OG/CC. This authority may be delegated to squadron or mission commanders when the unit is deployed. This authorization will not be construed to allow repeated buddy or windmill taxi starts at various scheduled en route stops. Load all passengers after completion of a buddy or windmill taxi start.

**5.22. Inter.** Takeoffs will normally be made from the beginning of the approved usable portion of the runway. The decision to make intersection takeoffs rests solely with the PIC and may be accomplished provided the operating environment (i.e. gross weight, obstructions, climb criteria, weather, etc.) allows a safe takeoff and departure. Calculate takeoff performance based on the runway remaining from the point at which the takeoff is initiated.

**5.23. Minimum Engine Performance. (T-1)** Minimum engine performance is 95% engine efficiency. The first take-off of the day should be a static take-off to verify engine performance. If 95% engine efficiency cannot be obtained on all engines, close engine bleeds and re-compute predicted torque to determine whether an engine or bleed air malfunction exists. In either case the aircraft will not be flown. ***CAUTION***: Prop blast from engine runs is hazardous to people, buildings, equipment, and other aircraft. Crews will ensure the area behind the aircraft is clear before starting an engine run. At no time will an engine run-up be attempted (throttles out of ground range) unless the aircraft is in an approved engine run-up site or on the active runway. ***CAUTION***: Request clearance from ground control or tower controller prior to an engine run-up. Clearance from either ground or tower does not constitute a safe environment for an engine run. Advise controller anytime prop wash will cross the runway.

**5.24. Reduced Power Operations. (T-1)** Reduced power operations are intended to prolong engine service life.

5.24.1. During proficiency flights (operations that are primarily confined to the traffic pattern) and tactical events, TIT will normally be 970 degrees C for takeoff, not to exceed 19,600 inch-pounds of torque. Higher power settings may be used, as required, and will be briefed by the pilot flying the aircraft.

5.24.2. Use maximum power for max effort takeoffs (actual or simulated), not to exceed 19,600 inch-pounds of torque. In order to prevent overtorques and if conditions permit, torques of less than 19,600 inch-pounds may be used to simulate max power during training.

**5.25. Power Application (T-1).** To help prevent overtorques, the flight engineer will make a call over interphone any time torque reaches 17,000 in-lbs. Pilots and flight engineers will monitor torque as throttles are advanced.

**5.26. Three-Engine Takeoffs. (T-1)** Actual engine-out takeoffs require MAJCOM/A3 or deployed equivalent waiver

**5.27. Aircraft Recovery from Unprepared Surfaces (T-1).** Aircrews should not attempt to recover an aircraft after inadvertent entry onto surfaces that are not suitable for taxi. Ground crews using appropriate equipment will normally recover the aircraft. Aircrews may recover the aircraft at austere locations if, after thorough inspection, the PIC is sure there is no aircraft damage and the surface will support the aircraft.

**5.28. Engines Running Onload or Offload (ERO). (T-1)** There are two types of onload/offload operations. They are Normal Engine Running Onload/Offload (ERO) and infil/exfil operations (rapids). Use EROs whenever practical and time is not critical. The paragraphs below discuss normal ERO procedures. See **paragraph 5.29** for Rapids procedures. ***NOTE:*** Do not use ERO procedures when explosive cargo (Hazard class 1.1-1.4) is involved unless authorized by the JA/ATT or exercise operation order or contingency air tasking orders. If AFTER LANDING Checklist is used, the ERO checklist need not be run for hot brake/hung flare checks.

5.28.1. The ERO procedures in this paragraph may be used for any mix of personnel or cargo. The aft cargo door and ramp is preferred when more than 10 passengers are involved. PICs will assess prevailing weather, lighting, and parking location to ensure safe operations.

5.28.2. General Procedures:

5.28.2.1. PICs will brief crewmembers on the intended ERO operation, emphasizing specific crewmember duties.

5.28.2.2. The parking brake will be set and one pilot will monitor brakes, interphone, and radio.

5.28.2.3. Operate engines in ground idle (low speed, if applicable). If conditions warrant, open air deflector doors and adjust flaps to further reduce prop blast.

5.28.2.4. Turn wing leading edge lights on during night EROs. Taxi lights may be used at the discretion of the PIC.

5.28.2.5. Complete passenger and cargo manifests, crew lists, and DD Form 365-4, **Weight and Balance Clearance, Form F,** for the subsequent sortie. ***NOTE:*** DD Form 365-4 is not required for the subsequent sortie if the aircraft will depart empty.

5.28.2.6. Resume taxi after the LM has verbally acknowledged that the aircraft is ready to taxi.

5.28.2.7. Do not onload or offload through the crew entrance door and ramp, or paratroop doors, simultaneously. ***WARNING:*** Due to the hazards involved (i.e., prop blast, proximity to engines and props, lack of paratroop door steps, etc.), only hand transferable items of cargo may be onloaded or offloaded through the paratroop doors during EROs.

5.28.3. Personnel onload and offload through the crew entrance door.

5.28.3.1. The PIC will give clearance to open the crew entrance door.

5.28.3.2. During onload and offload, station a crewmember (normally the LM) on interphone (cord held taut) approximately 25 feet and at a 45-degree angle from the aircraft axis.

5.28.3.3. Brief deplaning personnel to remain forward of the interphone cord.

5.28.4. Personnel or cargo onload and offload through the aft cargo door and ramp.

5.28.4.1. After the aircraft has slowed to taxi speed, the LM may remove all tiedowns except one forward and one aft restraint. Remove remaining restraints only after the aircraft is stopped and vehicle drivers are in place. Drivers will not release vehicle parking brakes until all restraints are removed and cleared to proceed by the LM.

5.28.4.2. Upon clearance from the PIC, open the aft cargo door and lower the ramp to 12 inches above horizontal.

5.28.4.3. The LM will direct all onload and offload operations using prebriefed signals. Passengers will be escorted by a crewmember when emplaning or deplaning. Deplane passengers before cargo and enplane passengers after cargo unless cargo size or location dictates otherwise. ***NOTE*:** Does not apply to infil/exfil operations. During infil/exfil operations onload and offload cargo as static trained.

5.28.4.4. Other qualified LMs may direct the operation, if available, but the crew loadmaster retains overall responsibility for the operation.

5.28.4.5. Station the crew loadmaster or another crewmember on interphone and PA in the cargo compartment as a safety observer. Safety observers other than the LM will remain forward of all cargo.

5.28.5. ERO for crew changes during local training missions is authorized provided the enplaning crew does not approach the aircraft until the deplaning LM on headset is in position outside the aircraft.

**5.29. Combat Loading. (T-1)** Combat loading is comprised of three types of operations: combat offload, passenger combat loading, and infil/exfil operations (rapids). See AFTTP 3-3.HC-130 for additional guidance. All personnel in the cargo compartment will be seated and secured except those personnel having valid duties to perform.

5.29.1. Combat off-load. Combat off-load provides a means of off-loading single, multiple, and married pallets; ramp and airdrop platforms; and CDS containers without the use of Material Handling Equipment (MHE). Directors of operations or mission commanders may authorize combat off-load when hostile conditions or similar situations warrant the use of these procedures. Basic qualified crews can use combat off-load procedures. ***NOTE:*** Only HC-130 aircraft modified with dual rails may conduct combat off-load operations.

5.29.2. Passenger Combat Loading. Additional procedures are located in AFTTP 3-3.HC-130. Floor loading is authorized to support dedicated forces and foreign counterparts during operations, exercises, and training. Standard seating configurations listed in AFI 11-2HC-130V3, Addendum A, *HC-130 Configuration/Mission Planning*, are recommended, if practical.

5.29.2.1. When airlifting litter patients, position the litters longitudinally with patients' heads aft and secure each of the litters with a tiedown strap. When injuries do not permit adequate lateral restraint to prevent longitudinal movement, a medical technician or designated individual may provide additional restraint. The PIC will be notified when personnel are not seated and secured for takeoff and landing.

5.29.2.1.1. For one litter, hook the tiedown strap into a floor ring, run laterally, wrapping the strap around each litter handle once, hook the ratchet end to the nearest to the nearest tiedown ring, and tighten.

5.29.2.1.2. For two litters side by side, use two tiedown straps for each end. Center the inboard handle of each litter over the same ring and hook the hook end of each strap to the same ring(into "D" row rings unless mission dictates otherwise), run the straps laterally, one left and one right, over each outboard litter handle to the nearest tiedown ring, and tighten.

5.29.2.1.3. For three litters side by side, wrap the straps around adjacent handles.

5.29.3. Infil/Exfil operations. Infil/exfil operations are a tactical method of on-loading or off-loading dedicated unconventional and rescue/special operations forces. Spring-loaded, latch-activated, folding ramps (canary slides) or ground loading ramps are used to off-load and on-load vehicles and/or personnel in minimum time.

5.29.3.1. Egress and Static Load Training. Conduct static load training prior to all Infil/Exfil operations. ***EXCEPTION:*** For unilateral Infil/Exfil training conducted with home-station assigned units using All-Terrain Vehicles (ATV), Quads, Polaris, Gator type vehicles, the OG/CC may waive this requirement.

5.29.3.2. Vehicle Restraint Procedures. User will identify any "load specific" tiedown requirements or limitations.

5.29.3.3. LMs will wear NVGs during blacked-out rapid infil/exfil operations.

5.29.3.4. Procedures after Touchdown:

5.29.3.4.1. Open the cargo ramp and door to horizontal when the pilot states, "Clear To Open," or as prebriefed. Lower the ramp to the ground once the aircraft has stopped, parking break has been set and the pilot states, "Clear To Offload." ***CAUTION*****:** Maintain positive control of canary slides/ground loading ramps.

5.29.3.4.2. Position canary slides/ground loading ramps. ***NOTE:*** If a time delay is anticipated before onloading, raise the ramp enough to allow the aircraft to taxi in the event of an emergency.

5.29.3.4.3. Complete offload/onload.

5.29.3.4.4. Raise canary slides/ground loading ramps.

5.29.3.4.5. Raise the ramp to approximately 12” above horizontal.

5.29.3.4.6. Notify the pilot, "Clear To Taxi."

5.29.3.4.7. Secure canary slides/ground loading ramps.

5.29.3.4.8. Close the ramp and door.

5.29.3.4.9. Turn on the red or NVG-compatible lights.

5.29.3.4.10. Prior to takeoff, ensure vehicles/equipment, personnel and exits are secure, and warning lights are extinguished.

5.29.3.4.11. Connect/engage ADS arms after takeoff as soon as mission requirements allow.

5.29.3.4.12. Check vehicle tiedowns and secure cargo compartment after takeoff as soon as mission requirements allow.

# Chapter 6

# GENERAL OPERATING PROCEDURES

***Section 6A—Pre-Mission***

**6.1. Aircrew Uniforms (T-1).**

6.1.1. Wear the aircrew uniform as outline in AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel*, and the appropriate MAJCOM supplement, on all missions; unless other attire is authorized (when the USAF Foreign Clearance Guide (FCG) requires civilian attire, wear conservatively styled clothing).

6.1.2. All aircrew members will have flight gloves readily available during flight and will wear them for takeoffs, landings, and when operating in a combat environment. Loadmasters will wear gloves for all airdrops and pyrotechnic operations.

6.1.3. Crewmembers will remove rings and scarves before performing aircrew duties.

6.1.4. Arctic clothing is required when engaged in Arctic or Antarctic operations.

**6.2. Personal and Professional Equipment. (T-1)**

6.2.1. Passports. Carry passports on missions when required by the Foreign Clearance Guide.

6.2.2. Shot Records. Carry shot records on all off-station missions outside the CONUS, Alaska, or Hawaii. Aircrew members will ensure they meet immunization requirements for the mission.

6.2.3. Identification Tags. Identification tags should be worn around the neck or carried in a flight suit pocket.

6.2.4. FOD Hazards. Crewmembers will not wear wigs, hairpieces, rings, ornaments, pins, clips, other hair fasteners, or earrings in the aircraft or on the flightline. ***EXCEPTION*:** Plain elastic hair fasteners or plastic barrettes are allowed for female crew members, providing they do not interfere with the wearing of headsets or helmets, or the donning of oxygen equipment. All devices will be accounted for before and after flight.

6.2.5. Flight Kits. Carry a headset, helmet and oxygen mask, and operable flashlight on all flights. ***EXCEPTION:*** FTUs may dictate carrying of helmet and oxygen mask based on mission requirements IAW AFI 11-301V2. ***NOTE:*** Crewmembers will present their personal helmet and oxygen mask to an aircrew flight equipment facility for cleaning, maintenance, and communications testing every 30 days.

6.2.6. Restricted Area Badges. Carry the restricted area badge on all missions (except actual combat missions). Display the badge only in designated restricted areas.

6.2.6.1. Badges will be attached by a lanyard to uniform or displayed on arm band or double breakaway lanyard around the neck and will not be displayed from before starting engines until engine shut- down

6.2.7. Reflective Belts. A reflective belt or suitable substitute will be worn IAW local directives.

6.2.7.1. Deployed commander will direct use in combat zone but will normally be worn during night operations.

6.2.8. Tool and Airdrop Kits. A tool kit will be on board for all flights. Individual units will establish requirements for tool kit contents. One LM airdrop kit will be on board for aerial delivery missions.

6.2.8.1. For PDM inputs carry a tool kit containing as a minimum: multi-tool (screw drive, pliers, wire cutter) safety wire, fuse pullers and a 3/8” wrench.

6.2.9. Hostile Environment Repair Procedures (HERP) Kit. One HERP Kit will be onboard for all OCONUS and contingency deployment missions. Units will identify where the HERP Kit will be stored on the aircraft in the local supplement to this AFI. The flight engineer will ensure the HERP Kit is onboard and serviceable (sealed) during the aircraft preflight prior to departure.

6.2.10. All crewmembers will carry and perform a thorough preflight their own NVGs prior to flight for missions using NVGs. See **paragraph 15.8** for additional requirements.

6.2.11. Survival and Protective Equipment. All personnel will wear or have readily available the survival and protective gear provided during hostile environment operations. Such equipment, if available, includes, but is not limited to the following: individual aircrew body armor, LPU, survival vest and kit, parachute/harness, and protective headgear. Unit/Deployed commanders may amend survival/protective equipment requirements based on the threat/operational necessity. ***EXCEPTION:*** Pilots may doff equipment that interferes with control yoke movement.

**6.3. FCIF. Flight Crew Information File (FCIF). (T-1)** Crew members will review the FCIF before all missions and place initials on AF Form 4121, **FCIF Currency Record** or MAJCOM approved electronic guidance.

6.3.1. Crewmembers delinquent in FCIF and joining a mission en route will receive an FCIF update from their primary aircrew member counterpart on that mission. Instructor pilots flying with general officers are responsible for briefing appropriate FCIF items.

6.3.2. Crewmembers without a unit FCIF card (not assigned or attached to the unit) will certify FCIF review by entering the last FCIF number and their initials beside their name on the file copy of the flight authorization.

**6.4. Airfield Review.** Accomplish airfield review IAW AFI 11-202V3.

**6.5. Intelligence Briefing. (T-1)** Before departing on missions outside the United States, crews will receive an intelligence briefing that will emphasize terrorist, enemy, and friendly political and military development in the area in which they will be operating. In theater, aircrews should receive intelligence updates on initial arrival at a forward operating location (FOL), or enroute stop, and thereafter when significant developments occur. Aircrews will report information of possible intelligence value to local intelligence officers at completion of each mission.

**6.6. Aircrew Publications Requirements. (T-1)**

6.6.1. Primary crewmembers will carry the publications specified in **Table 6.1** on all missions. Units may specify additional publications in their unit supplement. For multiples of a crew position, each will carry a checklist but otherwise only one set of publications is required. Units may establish a process to provide these publications onboard the aircraft in-lieu-of individuals carrying publications. This process must be described in the local unit supplement.

6.6.2. Electronic Publications (E-Pubs). If the MAJCOM has an approved an Electronic Flight Book Program/e-tool device IAW *AFI 11-202V3*, paper copies are not required after the transition is complete.

6.6.2.1. All electronic media will be of equal or higher quality than paper versions and if used will require e-tool viewing sources (hardware) on board the aircraft.

6.6.2.2. FLIP products may also be viewed/utilized in-flight via an approved e-tools device.

6.6.2.3. Abbreviated checklists, approach/departures plates, standard instrument departure (SID), and standard terminal arrival route (STAR) publications will remain in paper format unless an approved e-tool device is specifically authorized for use with these items.

6.6.2.4. Operations Group Stan/Eval (OG/OGVs) will develop procedures and standards for maintaining, updating and disseminating the e-pubs program. Procedures will also address a data backup plan at the OG/OGV level for the master publications file. For this purpose, utilize a minimum of three separate data media storage devices (e.g., CD-ROM, hard drive, and local area network drive).

6.6.2.5. Electronic copies of unit publications library are acceptable for deployments with appropriate equipment/software to view publications. Ensure all copies are up-to-date and publications not available electronically are to be maintained in paper format. Appropriate equipment to view these files must be available.

**Table 6.1. Aircrew Publications (T-1).**

| **PUBLICATION** | **AIRCREW** |
|---|---|
| Aircraft Flight Manual (-1) | FE |
| Aircraft Performance Manual (1-1) | FE |
| -1 Flight Manual Checklists | All crewmembers will carry the abbreviated checklist(s) for their crew position. |
| *ATP-56B Part 3* | FE and LM |
| *ATP-56B Part 5, Annex ZD* | FE |
| *T.O. 1C-130-1-4 (SCNS aircraft)* | N (P or CP, if navigator not on board aircraft) |
| *T.O. 1C-130-101* | FE |
| *T.O. 3-1-6* | FE |
| *T.O. 1C-130A-9, Cargo Loading Manual* | LM |

| | |
|---|---|
| *AFI 11-202V3* | P |
| *AFI 13-217* [1] | N |
| *AFI 11-231* [1] | N |
| *AFI 11-2HC-130V3* | PICs will carry entire AFI. All other crew positions will carry the chapters that reference their crew duties. |
| *AFTTP 3-3.HC-130* | N and LM (P/CP, if navigator not on board aircraft) |
| *AFSOCM 11-201 (HERP)* | FE |
| ***Note 1:*** *Navigators must carry during all airdrop and tactical airland missions.* | |

***Section 6B—Predeparture***

**6.7. Authenticators and Classified Material.** Obtain and safeguard current authenticators and other classified materials required for the area being transited. Carry authenticators when flying into an ADIZ, participating in exercises, on overseas missions, deployments, and when specified in operation plans.

6.7.1. The COMSEC material required depends on the theater of operation and user. The base COMSEC custodian has access to the AFKAG 44/AFKAG 14 and can assist in obtaining the material required for the mission. Base Operations at AMC bases maintains the COMSEC material used on most missions.

6.7.2. Turn in authenticators and other classified materials at your ultimate destination and obtain receipts for classified material. Command Posts may provide temporary storage for authenticators/classified materials during ground time at en route stops. Issue and turn-in of authenticators is normally a function of Base Operations. At locations where no storage facilities exist, classified materials may be stored in the aircraft safe, if available.

6.7.3. Remove classified information stored in any electronic devices.

6.7.4. Clear all TRANSEC systems, such as secure voice and IFF.

6.7.5. In the event of an emergency, destroy or damage classified material and equipment prior to crash landing or bailout, if possible.

**6.8. Mission Kits. (T-2)** Units will maintain one mission kit per aircraft. ***EXCEPTION:*** FTUs will establish the number and content of the mission kits for their assigned aircraft.) Prior to off-station departures, the PIC will ensure a current mission kit is on board the aircraft. The kit will contain, but is not limited to the items listed in **Table 6.2** Items required by a unit or wing directive to be carried by an individual crewmember need not be duplicated in the mission kit. Maintain sufficient quantities of directives and planning documents to allow implementation of evacuation and contingency plans.

**Table 6.2. Aircraft Mission Kit (T-2).**

| |
|---|
| **SECTION I – Publications** |

<table>
<tr><td colspan="2">1. AFI 11-2HC-130V1, HC-130 Aircrew Training<br>2. AFI 11-2HC-130V2, HC-130 Aircrew Evaluation Criteria<br>3. HQ AMC Airfield Suitability and Restrictions Report<br>4. DOD 4515.13R, Air Transportation Eligibility<br>5. DOD Foreign Clearance Guide (when applicable)</td></tr>
<tr><td colspan="2">SECTION II – Forms</td></tr>
<tr><td rowspan="3">AF Forms<br>15, USAF Invoice<br>70, Pilot's Flight Plan and Log<br>315, USAF AV Fuels Invoice<br>457, USAF Hazard Report<br>651, Hazardous Air Traffic Report<br>1297, Temporary Issue Receipt<br>2282, Statement of Adverse Effect – Use of Government Facilities<br>3823, Drop Zone Survey<br>4015, HARP Computation<br>4017, CARP Computation<br>4051, Low Level Flight Plan and Log<br>4052, C-130 Air Refueling Worksheet<br>4053, INS Flight Plan Log<br>4108, C-130 Fuel Log<br>4116, C-130 Flight Plan Record<br>4118, SCA Planning Form<br>4119, C-130 Fuel Planning Worksheet<br>4122, Airborne Radio Log<br>4123, Airdrop Card<br>4125, Range Control Chart<br>4139, Special Operations Refueling Worksheet</td><td>DD Forms:<br>175, Military Flight Plan<br>175-1, Military Weather Brief, or Mission Execution Forecast<br>791, In-flight Issue Log<br>1385, Cargo Manifest<br>1848-2, Airdrop Malfunction Report<br>1801, DOD International Flight Plan<br>1854, U.S. Customs Accompanied Baggage Declaration or<br>CBP6059B, Customs Declaration<br>2131, Passenger Manifest<br>CBP 7507, General Declaration (Outward/Inward)Agriculture, Customs, Immigration, and Public Health</td></tr>
<tr><td></td></tr>
<tr><td></td></tr>
<tr><td colspan="2">SECTION III – Miscellaneous</td></tr>
<tr><td colspan="2">1. Foreign Nation Custom Forms (when applicable)</td></tr>
<tr><td colspan="2">2. All applicable local forms</td></tr>
<tr><td colspan="2">3. Box Car Seals</td></tr>
</table>

**6.9. Navigation Kits (T-2).**

6.9.1. The PIC or a designated crew member will be issued a route navigation kit at the home station, which will remain with the aircraft until its return. Kits should contain sufficient quantities of materials to cover the complete round trip from the issuing station and return, plus appropriate materials to cover the theater of operation.

6.9.2. Segregate route navigation kits into two separate parts:

6.9.3. Part I. Sufficient material to cover the planned route trip and theater of operation.

6.9.4. Part II. For inter-theater missions only. Maps, charts, and flight information publications for global operation, excluding items in Part I.

6.9.5. Minimum contents of route navigation kits will be in accordance with **Table 6.3** Commanders may modify the items as necessary for local training missions.

**Table 6.3. Route Navigation Kits (T-2).**

| Item (Applicable to Area of Operations) | Part I | Part II (Global) |
|---|---|---|
| FLIP Planning (GP, AP/1, AP/2, AP/3, AP/4) | 1 | 1 |
| FLIP IFR Supplement | 2 | 1 |
| FLIP Flight Information Handbook (FIH) | 2 | 1 |
| FLIP En Route Charts (High and Low) | 2 | 1 |
| FLIP Area Charts (Terminal) | 2 | 1 |
| FLIP Instrument Approach Procedures (High and Low) | 3* | 1 |
| Standard Instrument Departures (SID) | 3* | 1 |
| OPREP-3 Report Format | 1 | 1 |
| Maps and Charts | As Required | 1 ea. GNC |
| FLIP VFR Supplement | 1 | |
| AF Form 72, *Air Report (AIREP)* | 3 | |
| * Two required when a navigator is not part of the crew. ***NOTE:*** Units may modify the global kit to carry only FLIP documents for the theater in which the mission will operate. | | |

**6.10. Briefing Requirements.**

6.10.1. Briefings should be clear, concise, and designed to provide mission essential information. Refer to the appropriate briefing guides for content.

6.10.2. Crewmembers will not fly unless they attend the crew briefings for their mission (T-2). ***EXCEPTION:*** When premission requirements dictate, PIC may excuse certain crewmembers from the briefing. The PIC will ensure that those personnel receive a face-to-face briefing prior to engine start.

**6.11. Call Signs.** Use Voice Call Sign Listing (VCSL) or as specified in mission directives for all missions except local area training missions. Use squadron or wing static call signs as directed for local area training missions.

6.11.1. Aeromedical Evacuation. Preface normal call sign with “AIR EVAC” when patients are on board.

6.11.2. Search and Rescue (SAR). When tasked to participate in SAR operations, use the call sign “AIR FORCE RESCUE” plus the last five digits of the aircraft tail number.

**6.12. Instrument Flight Rules.** Conduct flight operations under IFR to the maximum extent possible without unacceptable mission degradation. This does not preclude VFR training to maintain proficiency in mission essential VFR operations.

**6.13. Sensitive Mission Operations. (T-1)**

6.13.1. Certain missions require special flight planning procedures or deceptive measures. Mission operating directives, MAJCOM/CC operations orders, or other tasking orders will direct use of these procedures. Aircrews will be briefed on modification to normal procedures prior to execution of the operation. The MAJCOM/CC or COMAFFOR will approve missions requiring coordination with non-ACC agencies prior to execution.

6.13.2. The planning agency tasked with the mission will provide the aircrew with the following information:

6.13.2.1. Departure procedures.

6.13.2.2. En route procedures to include tracks, ALTRVs, MARSA, tanker rendezvous, and emergency divert procedures.

6.13.2.3. Arrival procedures.

6.13.2.4. All communications requirements.

**6.14. Due Regard Procedures.** When a unit commander authorizes a mission to be flown in international airspace over the high seas, and in-flight operational requirements conflict with ICAO rules and procedures, the PIC may make the decision to proceed using Due Regard procedures in accordance with AFI 11-202V3 and FLIP GP.

**6.15. Flight Plan Verification. (T-1)** Regardless of whether a flight plan is prepared by the aircrew or furnished by another aircrew or agency, the PIC and navigator will jointly verify routing, altitudes, terrain clearance, airspace deconfliction, cargo, and fuel load prior to filing the flight plan. On overseas flights, verify the flight planned routing against the diplomatic clearance, if applicable. The navigator who prepares or accepts the flight plan will remain on duty at the navigator's station during departure and will brief the relieving navigator thoroughly on all en route and destination hazards.

**6.16. Takeoff and Landing Data (TOLD) Verification. (T-1)** The flight engineer will complete the AF IMT Form 4064, **C-130 Takeoff and Landing Data Card**, and the AF IMT Form 4063, **Pilot Information Card**, or locally developed version, in accordance with **Chapter 12.** A pilot crewmember or additional flight engineer will cross check the TOLD data for accuracy by using the performance manual, TOLD computer, or approved tabulated data. As a minimum, the person checking the data will:

6.16.1. Verify gross weight independently from the AF IMT Form 4063/4064.

6.16.2. Cross-check air minimum control Vmca (one engine inop in ground effect), takeoff, and landing speeds.

6.16.3. Review and compare the computed distances, ground roll, and climb gradient (if applicable) with the actual conditions, runway available, and departure procedures.

**6.17. Fuel Planning. (T-1)** Accomplish fuel planning in accordance with certified automated flight planning software or applicable aircraft performance manual. See **Chapter 11**.

6.17.1. Use primary fuel management, in accordance with the aircraft flight manual, whenever practical.

6.17.2. Add extra fuel:

6.17.2.1. When extra fuel is unavailable at en route stops; when compressed ground times during single-day, multi-sortie missions preclude refueling at each en route stop; or, when en route refueling would delay or be detrimental to mission accomplishment.

6.17.2.2. When passengers or patients are on board, to recover to a suitable airfield from the Equal Time Point (ETP) at 10,000 feet MSL in the event of unpressurized flight.

6.17.3. Fuel Conservation. Aircrews and mission planners will manage aviation fuel as a limited commodity and precious resource. Fuel optimization will be considered throughout all phases of mission planning and execution. Aircrews should employ the following aviation fuel optimization measures without compromising flight safety or jeopardizing mission/training accomplishment:

6.17.3.1. Optimize fuel loads. Mission plan for the required ramp and recovery fuel. Excessive ramp and recovery fuel adds to aircraft gross weight and increases fuel consumption.

6.17.3.2. Minimize aircraft weight through reduction of equipment not necessary for mission accomplishment.

6.17.3.3. Use low speed ground idle or two engine symmetrical power when practical for ground operation.

6.17.3.4. Cruise at optimum altitude. Step climb if practical.

6.17.3.5. Fly missions at the most fuel conservative cruise speed option. On missions that are time- rather than distance-oriented, consider flying the lowest practical cruise option. Aircraft commanders are encouraged to fly long-range cruise airspeeds on other missions, if practical.

6.17.3.6. Cruise at the altitude that gives the best ground distance traveled for each pound of fuel consumed. As a technique, climb if ground speed is reduced less than 5 knots for each 1,000 feet of altitude increase. Descend if ground speed will increase more than 5 knots for each 1,000 feet of altitude decrease. Do not fly above cruise ceiling.

**6.18. Required Fuel At Destination. (T-1)** Minimum fuel overhead destination or alternate is 7,000 pounds. Land with a minimum of 6,000 pounds fuel remaining.

**6.19. Departure Planning.** Use *AFI 11-202V3, AFMAN 11-217V1, Instrument Flight Procedures, AFMAN 11-217V2, Visual Flight Rules,* this chapter; and the appropriate MAJCOM supplements. Regardless of the type of departure flown (IFR/VFR), review the following (as appropriate): IFR Departure Procedure, instrument approach plate, NOTAMS, GDSS Giant Report, and suitable terrain charts.

16.19.1. The PIC will provide the flight engineer with the obstacle height, distance, and gradient information necessary to calculate performance computations for departure, alternate, and destination airfields (T-1).

16.19.2. Alternate Takeoff Minima are authorized IAW **Table 6.4**

**Table 6.4. Alternative Takeoff Minima and Departure Alternate Procedures.**

| **If departure weather is:** | **Departure is:** | **A departure alternate is:** |
|---|---|---|
| At or above authorized ceiling and visibility landing minimums. | Authorized | Not required |

| | | |
|---|---|---|
| Below either authorized ceiling or visibility minimums and RVR is 1600 or greater (visibility ¼ miles or greater): | Authorized for Operational Missions only | Required (see notes 1 and 2) |
| Below either authorized ceiling or visibility minimums and RVR is less than 1600 but equal to or greater than 1000. | Authorized for operational missions only | Required (see notes 1, 2 and 3) |

***Notes:***

1. To qualify as a departure alternate, the airfield must meet one of the following conditions:

a. Alternate must be located within 30 minutes flying time, the existing weather must be equal to or better than the published approach minimums and forecast to remain so until 1 hour after takeoff, but in no case forecast to be lower than 200-1/2 (RVR 2400).

**-OR-**

b. Alternate must be located within 2 hours flying time, with weather to be at least 500-1 above the approach minimums, but no lower than 700-2 for a precision approach or 800-2 for a non-precision approach for ETA at the alternate +/- 1 hour.

2. Aircraft must be capable of maintaining the MEA to the alternate using one engine inoperative (OEI) performance criteria.

3. Departure runway must have operational centerline lighting and dual RVR readouts and displays for both the approach and departure end of runway (RVR must be at or greater than 1000 at both the approach end and departure end and runway). For runways with triple RVR readouts, the pilot may use any two consecutive read-outs to determine if the runway is usable for departure (aircraft performance permitting). For example: Approach end RVR=800, midfield RVR=1200, departure end RVR=1000. If aircraft performance and runway length will permit taking off at midfield, this runway is usable for takeoff.

**6.20. Departure Climbout.** Comply with *AFI 11-202V3, AFMAN 11-217V1/V2*, and published departure procedures for IFR and VFR Departures requirements.

**6.21. Operation in the Vicinity of Hazards. (T-1)** Aircraft will not be operated in any forecasted or actual severe condition (e.g. severe icing, turbulence, etc).

6.21.1. Avoid thunderstorms and cumulonimbus clouds (CBs) using the following criteria:

6.21.1.1. Climb Out, En route, and Descent:

6.21.1.1.1. FL 230 and Above: 20 NM.

6.21.1.1.2. Below FL 230: 10 NM.

6.21.1.1.3. Low level operations: 5 NM.

6.21.1.1.4. Avoid the rain shaft and cloud base of thunderstorms and CBs using the aforementioned criteria. ***WARNING*****:** Do not fly under the anvil of a cumulonimbus cloud.

6.21.1.1.5. Clear the top of a known or suspected severe thunderstorm by at least 1,000 feet altitude for each 10 knots of wind speed at the cloud top. Avoid gust fronts and winds preceding a rapidly moving thunderstorm.

6.21.1.1.6. Avoid thunderstorms visually, by airborne radar, or by specific request of a ground-based radar with a weather painting capability. When relying exclusively on ground-based radar for weather avoidance and the ground controller is unable to provide avoidance instructions, attempt to maintain VMC by:

6.21.1.1.6.1. Changing routing.

6.21.1.1.6.2. Diverting to alternate.

6.21.1.1.6.3. Declaring an emergency and requesting priority assistance if unable to maintain VMC in an area of significant weather and the ground radar facility cannot provide weather avoidance service.

6.21.1.1.7. The use of ground-based radar as the primary means of thunderstorm avoidance should be used only to depart an area of significant weather. It should never be considered a normal avoidance procedure.

6.21.1.2. **Takeoff, Approach, and Landing.** IAW MAJCOM guidance. See *AFI 11-202V3* as supplemented. ***EXCEPTION:*** If MAJCOM guidance does not exist, the following restrictions will be observed.

6.21.1.2.1. In order to minimize exposure to thunderstorm hazards when approaching or departing an airport in an area where thunderstorms are occurring or are forecast:

6.21.1.2.1.1. Attempt to maintain VMC.

6.21.1.2.1.2. Maintain at least 5NMs separation from heavy rain showers.

6.21.1.2.1.3. Avoid areas of high lightning potential, i.e., clouds within plus or minus 5,000 feet of the freezing level or plus or minus 8°C of the freezing level.

6.21.1.2.2. Approaches or departures may be accomplished when thunderstorms are within 10NMs providing they are not producing any hazardous conditions (such as hail, lightning, strong winds, gusts fronts, heavy rain, wind shear, or microburst) at the airport, and are not forecast or observed to be moving in the direction of the route of flight (to include the planned missed approach corridor, if applicable).

6.21.2. Lightning Avoidance. The following conditions are most conducive to lightning strikes and prolonged flight in them should be avoided:

6.21.2.1. Within 8°C of freezing.

6.21.2.2. In clouds or in any intensity of precipitation or turbulence associated with thunderstorm activity.

**6.22. Arrival Planning.** Comply with *AFI 11-202V3* for destination and alternate weather requirements.

**6.23. Risk Management (RM). (T-1)** Risk is inherent in flying operations but should be minimized consistent with achieving mission accomplishment and training objectives.

6.23.1. Ops Group commanders will develop RM guidelines to identify and mitigate acceptable levels of risk for performing contingency and training operations. USAF policy on RM is contained in AFI 90-802 *Risk Management*.

6.23.2. PICs will accomplish RM assessment IAW local guidance as part of preflight activities.

***Section 6C—Preflight***

**6.24. Preflight. (T-1)** The pre-flight inspection is a flight preparedness inspection done in accordance with the -6 maintenance requirements manual and the -1 flight manual (as applicable). The pre-flight inspection includes visually examining the aerospace vehicle and operationally checking certain systems and components to ensure there are no serious defects or malfunctions.

6.24.1. A preflight will be required prior to the first flight of the flying period, or when the preflight validity period has expired, or a maintenance dash six preflight is performed.

6.24.2. Aircraft Dash One Preflight Inspection Requirements. The aircraft dash one preflight inspection will remain valid until aircraft ground time exceeds 12-hours (72-hours provided the aircraft is sealed (with a boxcar seal), not flown, and documented entry control is maintained). Refer to **paragraph 6.25** for alert aircraft requirements.

6.24.3. Dash One preflight inspections are normally done in preparation for flight by the aircrew assigned to fly the mission designated for that aircraft. Having a partial aircrew, not scheduled to fly, accomplish multiple preflights on aircraft not scheduled for the next day's mission should not normally be accomplished, except to prepare for UEIs, and contingencies.

6.24.4. When an aerospace vehicle is mobilizing for deployment, units are authorized to place the aerospace vehicle on alert status. It must be prepared in accordance with established technical orders, accepted by an aircrew, remain under the control of operations, and be monitored by maintenance. When sealing an aerospace vehicle, accomplish a complete pre-flight inspection prior to sealing the aircraft and again before flight after completion of the alert status if the pre- flight validity period has been exceeded. Consequently, further preflight inspection or certification of a pre-flight inspection is not required during the alert period.

6.24.5. When placing an aerospace vehicle on alert status, accomplish a complete pre-flight inspection prior to going on alert and again before flight after completion of the alert period if the pre-flight validity period has been exceeded. Consequently, further preflight inspection or certification of a pre-flight inspection is not required during the alert period. (Placing a unit on alert does not in itself place the unit's aerospace vehicle on alert status).

6.24.6. When an aircrew assumes a preflighted spare or quick-turn, a thorough visual inspection will be performed, paying particular attention to areas affected by maintenance or servicing.

**6.25. Alert Aircraft. (T-1)** Maintain aircraft on alert status as follows:

6.25.1. Park the aircraft in a designated alert parking area to expedite taxi and takeoff.

6.25.2. Whenever operationally feasible, have a crew other than the alert crew preflight the alert aircraft. If this is not feasible, follow procedures outlined in **paragraph 3.6.5**

6.25.3. Aircraft preflight times should align with the alert period and aircraft preflight validity period, eliminating the need to update the preflight during the alert period.

6.25.4. The alert aircraft may be flown for purposes other than actual alert missions provided the following conditions are met:

6.25.4.1. Alert requirements can be met with sufficient fuel to meet mission requirements.

6.25.4.2. Communication contact is maintained with the primary controlling agency.

6.25.4.3. Controlling agencies are notified any time the alert aircraft departs the local area.

6.25.4.4. The provisions of **paragraph 3.6.5.2** are followed.

6.25.5. Maintenance Thru-Flight Inspections.

6.25.5.1. IAW *T.O. 00-20-1*, the maintenance thru-flight inspection is a between flights inspection and will be accomplished after each flight when a turnaround sortie, continuation flight or continuation of alert is scheduled and a basic post-flight inspection is not required. The thru-flight inspection consists of checking the aerospace vehicle for flight continuance by performing visual examination and/or operational checks of certain components, areas, or systems, according to established TOs to ensure that no defects exist which would be detrimental to further flight.

6.25.5.2. If maintenance actions are not required, (Alpha-1), the aircraft can be resealed for alert once the aircraft servicing is complete. A new aircrew preflight is not required until the end of the preflight validity period (72 hours).

6.25.5.3. If maintenance actions are required (Alpha-2) and the preflight validity period has time remaining, the aircrew may reseal the aircraft after thorough inspection of maintenance actions.

6.25.5.4. If prolonged maintenance is required (Alpha-3), the Squadron/Deployed Commander will release the aircraft to maintenance for repairs. Normally a complete maintenance Dash Six and aircrew Dash One pre-flights are required if major maintenance is accomplished. If minor maintenance is accomplished and the aircraft is capable of returning to alert status within normal turnaround times, the flight engineer may inspect the affected area and place the aircraft back on alert status provided time remains on the alert preflight validity period.

6.25.6. Should the aircraft remain on alert for more than 72 hours, a complete aircrew preflight is required.

6.25.7. Entry Procedures. The purpose of sealing an aircraft is to protect from unauthorized entry. A sealed, alert aircraft is off-limits to all personnel except alert crewmembers. If entry is necessary for maintenance, the DO/Ops Sup and MX/Pro Sup will be notified of the entry. The aircraft must be resealed upon completion of any required actions and the new seal number documented in the Form 781A. In the absence of this documentation, consider the Dash-1 preflight invalid and accomplish a new preflight. Re-accomplish the -9 inspection when required IAW *T.O. 1C-130A-9*.

6.25.8. A DD Form 365-4 will be prepared for the alert aircraft. Alert crews are authorized to prepare a TOLD card using the worst weather conditions expected for the alert period. Use the TOLD data for alert scrambles. If the alert aircraft is flown for other reasons, use TOLD for the existing weather conditions.

6.25.9. When a preflighted alert aircraft changes, or an alert crew change occurs and the same aircraft remains on alert, the oncoming crew will, as a minimum, apply power to the aircraft and check applicable items listed below:

6.25.9.1. Aircraft Forms; AFTO Form 781A, **Maintenance Discrepancy and Work Document**, AFTO 781H, **Aerospace Vehicle Flight Status and Maintenance**, and AFTO 781K, **Aerospace Vehicle Inspection, Engine Data, Calendar Inspection and Delayed Discrepancy Document**.

6.25.9.2. Interior and exterior for proper configuration and special equipment.

6.25.9.3. Fuel quantity.

6.25.9.4. Survival and emergency equipment.

6.25.9.5. Navigation and communication equipment.

6.25.9.6. Liquid oxygen quantity.

6.25.9.7. Hydraulic reservoirs and accumulator charges.

6.25.9.8. Publications.

6.25.10. Once the aircraft is accepted for alert, the flight engineer will ensure an entry is made in the AFTO Form 781A stating at a minimum the date and time the aircraft was preflighted.

**6.26. AFTO Form 781.**

6.26.1. Review the aircraft forms before applying power to the aircraft or operating aircraft systems. The exceptional release (ER) must be signed before flight. A maintenance officer, maintenance superintendent, or authorized civilian normally signs the ER. If one of these individuals is not available, the PIC may sign the ER. Ensure that the DD1896, *Jet Fuel Identaplate* and AIR card are on board the aircraft.

6.26.2. One-Time Flights. An aircraft may be released for a one-time flight with a condition that might be hazardous for continued use, provided the aircraft is airworthy for one flight to another station. Refer to T.O. 00-20-1, *Aerospace Equipment Maintenance Inspection, Documentation, Policies, and Procedures*, for downgrade authority and procedures. One-time flight approval authority is HQ ACC/A3. The PIC's concurrence is required before the aircraft can be flown.

6.26.2.1. For Red X clearing procedures at stations without maintenance support refer to **Chapter 12.**

6.26.2.2. The chief of maintenance, the senior maintenance officer, or the chief of the AFMC repair team must first authorize the release.

6.26.2.3. After the maintenance release is obtained, contact HQ ACC/A3, via Stan/Eval channels, for flight authorization. AFRC crews also see AFI 11-202V3/AFRCSUP1.

**6.27. IFF/SIF Operations. (T-1)** Perform a ground check of the IFF/SIF before takeoff, using either the self-test or ground radar interrogator.

6.27.1. If the self-test fails and radar facilities do not permit a ground check, takeoff is authorized if the IFF/SIF was operational on the previous mission. Accomplish an airborne check immediately after takeoff.

6.27.2. Aircraft will not depart with an inoperative IFF/SIF without the approval of ATC and the PIC (***EXCEPTION:*** Formations must have at least one operational IFF/SIF per element). If mode 4 fails in-flight, the IFF/SIF unit will be repaired prior to the next flight and/or the aircraft will land for repairs, except for the following:

6.27.2.1. Missions that are generated within CONUS and do not plan to penetrate the ADIZ.

6.27.2.2. Non-training peacetime missions where cancellation or return to base for mode 4 failure would seriously degrade mission effectiveness (i.e., presidential support, disaster relief, SAR, aeromedical evacuation, etc.)

6.27.2.3. Use the IFF/SIF in accordance with **Table 6.5** ***NOTE:*** Once set and transmitted, IFF/SIF modes 1, 2, and 3/A codes are unclassified and may be left in the transponder.

**Table 6.5. Worldwide IFF Chart.**

| IFF Mode | NATO | LANTCOM and NOPAC | All other areas |
|---|---|---|---|
| 1 | IAW *ACP 160*, *USAFER 60-17*, NATO directives, SPINS/ATO | IAW ACP 160, *U.S. Sup-1(C)*, *NI 10-41*, *NI 10-15*, *NR 55-68*, *NR 55-2*, SPINS/ATO | |
| 2 | IAW ACP 160, USAFER 60-17, NATO directives, SPINS/ATO | IAW ACP 160, U.S. Sup-1(C), and ANNEX A, SPINS/ATO | |
| 3 | As directed by ATC, SPINS/ATO | As directed by ATC, SPINS/ATO | As directed by ATC, otherwise IAW ACP 160, U.S. Sup-1(C) |
| 4 | Keyed and On | | |
| ***NOTE:*** Carry a keyer for use in the event of rerouting or diversion, except on local training missions. | | | |

**6.28. Aircraft Servicing and Ground Operations.**

6.28.1. Aircraft Refueling. Crewmembers qualified in refueling may perform refueling duties at austere locations or at stations without maintenance support. Crew chiefs should be scheduled on those missions where a need is anticipated. Two qualified personnel are required. Aircrews should not refuel except in cases when maintenance support is not readily available and the mission would be delayed.

6.28.1.1. Concurrent Ground Operations. Simultaneous aircraft refueling/defueling and cargo loading or maintenance operations are authorized in accordance with T.O. 00-25-172, *Ground Servicing of Aircraft and Static grounding/Bonding*. Refueling or defueling with passengers or patients on board is only authorized for aeromedical evacuation missions.

6.28.1.2. FARP/Hot Gas Operations. Refer to AFTTP 3-3.HC-130 and **Chapter 18** of this instruction.

6.28.2. Under no conditions are crewmembers allowed to service liquid oxygen.

**6.29. Fire Protection and Crash Rescue. (T-1)** The aircraft engine fire extinguisher system fulfills the minimum requirements for fire protection during engine start. If available, position a portable fire extinguisher for added fire protection.

6.29.1. A fireguard is required for all engine starts including the GTC/APU. A crewmember or ground controller may act as fireguard.

6.29.2. Aircrew/Maintenance Engine Runs. Mixed aircrew/maintenance engine runs will not normally be accomplished. If conducted, Crews will adhere to flight manual operating limits and procedures.

**6.30. Towing. (T-2)** Aircrew members will not normally participate in towing operations. The PIC will coordinate with the senior maintenance officer or superintendent to ensure the towing supervisor and crew are qualified. At non-USAF installations, the PIC must have approval from the airfield operations officer or manager prior to towing. The PIC will ensure the tow team supervisor briefs all personnel on their duties and the associated hazards. Proper checklists will be used. If any doubt exists as to the qualification of tow team personnel or the safety of the operation, make no attempt to tow the aircraft until qualified Air Force personnel can be located. Under no circumstances will any crewmember act as the towing supervisor.

**6.31. Aircrew Flight Equipment and and Oxygen Requirements. (T-1)** Prior to flight, The PIC or designated representative will ensure appropriate serviceable protective clothing, aircrew flight equipment, survival equipment, and Dash 21 equipment for the entire mission are available and all personnel are briefed or trained in their use. Prior to departing home station and following enroute crew changes, review the AFTO Form 46, **Prepositioned Life Support Equipment**, to ensure all required equipment is on board and required inspections have been completed. Crewmembers discovering equipment missing will make an entry in both the AFTO Form 781 and AFTO Form 46.

6.31.1. Oxygen. Oxygen on board must be sufficient to accomplish the planned flight from the equal time point should oxygen be required. Oxygen onboard for takeoff will be a minimum of 5.0 liters per functional LOX converter. On missions with passengers, carry passenger emergency oxygen systems (POK, EPOS, or other approved system) if flight above FL 250 is anticipated. Do not block access to these systems during flight. Distribute and demonstrate proper use prior to climbing through FL 250. The POK does not protect the wearer from smoke or fumes.

6.31.2. Crewmembers occupying a primary crew station will accomplish a communications and operations check of their oxygen equipment prior to flight. Crewmembers will preflight their planned source of oxygen (Quick Don and/or helmet and mask) to include communications checks. All flight deck crewmembers will use the quick don as the primary oxygen source when using headset. All flight deck crewmembers will use the oxygen mask as the primary oxygen source when using the helmet. The pilot, copilot, and flight engineer will be properly connected to the mask interphone system for all phases of flight. The quick don or oxygen mask will remain readily available for use from before engine start until after engine shutdown.

6.31.3. Walk-around bottles will not be considered as a primary source of supplemental oxygen for crewmembers performing duties in a primary crew position. Furthermore, walk-around bottles will not be considered as a source of supplemental oxygen for any crewmember during unpressurized operations requiring supplemental oxygen. See AFI 11-202V3 as supplemented and **Chapter 17**.

6.31.4. Rafts. Ensure sufficient wing well life rafts are on board to accommodate all passengers and aircrew members on overwater flights.

6.31.5. Life Preserver Units (LPUs). For overwater flights, ensure a sufficient quantity of life preservers are on board for all passengers and crewmembers. While overwater, LPUs will be sized and readily available at the crewmember's station, and worn whenever below 2,000 feet overwater (except for takeoff and landing). Crewmembers wearing a parachute or harness during air refueling overwater will also wear an LPU. For overwater missions carrying children and infants, ensure appropriate number and types of LPUs are on board. ***NOTE:*** Parachutists will provide their own LPUs. The flying unit will ensure the supported unit is aware when route of flight requires the use of LPUs. ***NOTE:*** Infil/Exfil operations may preclude issuing aircraft LPUs to user personnel. In this case ensure sufficient LPUs are onboard for all personnel.

6.31.6. Anti-exposure suits. Anti-exposure suits will be available during overwater flights when route of flight is beyond power off gliding distance from land and the water temperature is 60 degrees F or below (***NOTE:*** Anti-exposure suits are not required when only the approach or departure is flown over water). If the water temperature ranges between 51 degrees F and 60 degrees F, the unit or mission commander may waive or extend the anti-exposure suit requirement after carefully considering all risk factors.

6.31.7. Parachutes. HC-130 aircraft will be configured with parachutes as directed by MAJCOM guidance. Reference AFI 11-301 as supplemented. Units will dictate use of parachutes during combat or acceptance flights.

6.31.8. Restraint Harness. Personnel performing duties near an open door in-flight will preflight and wear a parachute or restraining harness. Wear a restraining harness during operations below 1000 feet AGL.

6.31.8.1. During training, loadmasters will wear a restraint harness when performing duties near an open exit in flight. Fit the restraint harness and adjust the lifeline prior to flight. ***NOTE:*** Connect the lifeline to a point that will preclude the wearer from exiting the aircraft. Restraint harness lifelines may be attached to an unused anchor cable that has an anchor cable stop positioned and taped at FS 737. Do not connect the lifeline to an anchor cable that has static lines attached to it for an airdrop. Connect the lifeline when at or anticipating moving aft of FS 677.

6.31.8.2. Flight examiner loadmasters are exempt from this requirement provided they are not performing primary or backup loadmaster duties and they will not position themselves aft of FS 677

6.31.9. Survival Kits/Vests. All HC-130 aircraft will be configured with one survival kit (ML-4) for each crewmember unless exempted or otherwise directed by MAJCOM. Reference AFI 11-301 as supplemented. Survival vests may be used in lieu of survival kits if the mission will not be conducted beyond gliding distance of land.

6.31.10. Protective Headgear.

6.31.10.1. All crewmembers will preflight and wear their helmets during contingency and combat missions at the discretion of deployed commander.

6.31.10.2. All personnel in the cargo compartment will wear protective headgear anytime a static line is attached to an anchor cable with the following exceptions:

6.31.10.2.1. SATB drops.

6.31.10.2.2. When the short anchor cable is used, only personnel aft of FS 617 must wear helmets. ***WARNING*:** Personnel will not position themselves directly under the center anchor cable supports (A-frames, FS 737) during personnel or equipment airdrops requiring the use of the anchor cable. ***WARNING*:** Personnel in the cargo compartment during airdrops will not be seated under the anchor cables or static line retriever cables that are rigged for use during that operation, unless cargo compartment configuration or mission requirements dictate otherwise. In that event, protective headgear will be worn.

6.31.10.3. Helmet visors will be lowered or eye protection worn by all personnel aft of FS 617 on all airdrops, HAAR, and pyrotechnic missions requiring doors to be open.

6.31.10.4. When conditions require personnel in the cargo compartment to wear protective headgear, the flight helmet will be worn with the chinstrap fastened from the first airdrop warning signal until the cargo compartment has been secured after the completion of the airdrop.

6.31.10.5. After acknowledgement of the 20-minute warning and donning of the helmet, LMs may clear off interphone, with the PIC’s approval, to facilitate movement around large platforms or CDS loads. After completing the required 20-minute checklist items, the primary LM will remain on interphone throughout the remainder of the airdrop.

**6.32. Cargo Documentation. (T-1)** Proper cargo documentation will accompany each load.

6.32.1. The cargo manifest and DD Form 1384, **Transportation Control and Movement Document (TCMD)**, and special handling documents as applicable, will be delivered to the aircraft before departure. The manifest will be one of the following:

6.32.1.1. Computer printed product.

6.32.1.2. DD Form 1385, **Cargo Manifest.**

6.32.1.3. DD Form 2130-2, **C-130 A/B/E/H Load Plan**. This form is designed for use during exercises, wartime, and contingency operations.

6.32.2. DD Form 2133, **Joint Airlift Inspection Record**, will accompany the manifest, if required.

6.32.3. Shipper's Declaration for Dangerous Goods prepared by the shipper in accordance with AFMAN 24-204(I), *Preparing Hazardous Materials for Military Air Shipments*, and DD Form 1075, **Convoy List of Remains of Deceased Personnel**, will accompany the manifest, if required.

**6.33. Passenger Restrictions.** DOD 4515.13-R establishes criteria for passenger movement on DoD aircraft. It defines five categories of passenger travel: space-available, aeromedical evacuation, orientation, public affairs, and space-required. AFI 11-401 provides further guidance on orientation and public affairs travel. Refer to these publications directly for details not addressed in this instruction. In all cases, passengers will be manifested on a DD Form 2131, **Passenger Manifest** (T-1).

6.33.1. Space-available. Authorized passengers, processed through the passenger terminal, may occupy surplus seats on DOD aircraft after all space-required passengers have been accommodated. The PIC may approve space-available travel after careful consideration of mission requirements and sensitivities.

6.33.1.1. Restrictions. Both pilots must be fully qualified. Group commanders or COMAFFOR may approve HAAR on a case-by-case basis. All other mission events and simulated EPs are prohibited.

6.33.2. Aeromedical Evacuation. Movement of patients by air. Specific guidance on eligibility and documentation is contained in DOD 4515.13-R. Commander, USTRANSCOM is the single manager for policy and procedure.

6.33.2.1. Restrictions. If tasked to conduct aeromedical evacuation, both pilots must be fully qualified. HAAR may be performed if required for mission accomplishment after coordination with tasking authority. All other mission events and simulated EPs are prohibited.

6.33.3. Orientation. AFI 11-401 defines four categories of orientation flight: incentive flights, distinguished visitor (DV) flights, familiarization flights, and spouse orientation flights.

6.33.3.1. Restrictions:

6.33.3.1.1. For spouse orientation, comply with restrictions in AFI 11-401 as supplemented. HAAR and threat maneuvers are prohibited.

6.33.3.1.2. For all other orientation categories, both pilots must be fully qualified. Group commanders or COMAFFOR may approve AR and HAAR on a case-by-case basis. Simulated EPs are prohibited. All other mission events may be conducted as approved by approval authority. Passengers will be seated with belts fastened during threat maneuvers.

6.33.3.1.3. AFRC units will comply with AFI 11-401 AFRCSUP 1 for orientation flight approval process and restrictions (T-2).

6.33.4. Public Affairs Travel. Travel in the interest of adding to public understanding of DOD activities. AFI 11-401 contains specific details on the Air Force Public Affairs Flight Program.

6.33.4.1. Restrictions. Both pilots must be fully qualified. Group commanders or COMAFFOR may approve HAAR on a case-by-case basis. Simulated EPs are prohibited. All other mission events may be conducted as approved by approval authority. Passengers will be seated with belts fastened during threat maneuvers.

6.33.5. Space-required. DOD 4515.13-R lists several categories of passengers who are authorized official travel on DOD aircraft. Apply the space-available processing, approval, and restrictions from **paragraph 6.29.1**

6.33.6. Mission Essential Personnel (MEP)**.** Procedures and policies regarding MEP are contained in AFI 11-401 as supplemented. The PIC will ensure personnel traveling in this status are properly authorized.

6.33.6.1. Restrictions. Both pilots must be fully qualified (unless excepted by AFI 11-401). Simulated EPs are prohibited. There are no restrictions on mission events. Passengers will be seated and secured during threat maneuvers. The PIC will ensure that supported forces are briefed on the mission profile and events before flight (T-3).

**6.34. Hazardous Material Procedures. (T-1)** Hazardous materials include substance or material that is capable of posing an unreasonable risk to health, safety, and property when transported. It may also be referred to as hazardous cargo or dangerous goods. AFMAN 24-204, *Preparing Hazardous Material for Military Air Shipment*, contains a description of the types and classes of hazardous cargo that may be carried. PICs are responsible for ensuring that all procedures contained in AFMAN 24-204 are complied with when airlifting hazardous cargo.

6.34.1. Hazardous materials are assigned hazard classes. The category of hazard assigned to a hazardous material based on defining criteria. Hazard classes are: explosives (Class 1), compressed gases (Class 2), flammable liquids (Class 3), flammable solids (Class 4), oxidizers and organic peroxides (Class 5), toxic/poisons and infectious substances (Class 6), radioactive materials (Class 7), corrosive materials (Class 8), and miscellaneous dangerous goods (Class 9). See AFMAN 24-204 for detailed information.

6.34.2. Cargo Documentation. Do not accept hazardous materials unless proper documentation, certification, and identification of cargo are provided. This includes transportation control number entered correctly on both the cargo manifest and the Shipper‘s Declaration for Dangerous Goods.

6.34.3. Shipper‘s Declaration for Dangerous Goods prepared by the shipper in accordance with AFMAN 24-204, **Preparing Hazardous Materials for Military Air Shipments**, and AF Form 127, **Traffic Transfer Receipt** (if required), will accompany the manifest.

6.34.4. Briefings. At a minimum, the PIC or a designated crew member must be briefed at the base of departure concerning onboard hazardous materials, including the information listed below. If any is omitted, request it before accepting cargo. Check the air cargo manifest (and attached Shipper's Declarations) before signing.

6.34.4.1. Proper shipping name (PSN), hazard class and division, and user name (UN), naming authority (NA), or identification number (ID).

6.34.4.2. Quantity of each hazard class by gross weight.

6.34.4.3. The Net Explosive Weight (NEW) for division 1.1 through 1.3 explosives.

6.34.4.4. Total net quantity of any toxic chemical ammunition or highly toxic substances.

6.34.4.5. Location on aircraft.

6.34.4.6. Passenger restrictions (P-Codes).

6.34.4.7. Smoking restrictions.

6.34.4.8. Special requirements, i.e., couriers, protective equipment, etc.

6.34.4.9. Cargo being carried under Department of Transportation (DoT) exemptions, certificate of equivalency (COE), a competent authority approval (CCA), or a waiver.

6.34.5. Border Clearance and Diplomatic (DIP) Clearances. The PIC is required to check the FCG for DIP Clearance requirements prior to departure on international flights transporting Hazardous Materials. If a DIP clearance is required the PIC will verify that clearance has been granted prior to departure. ***NOTE*:** Generally, DIP clearances are required for Hazardous Cargo and require flight plan annotation IAW the following paragraphs.

6.34.6. Flight Plans. Annotate "Hazardous Cargo" in the remarks section of the flight plan when any amount of the following is transported:

6.34.6.1. Division 1.1 through 1.3 explosives.

6.34.6.2. Toxic chemical ammunition (compatibility group K).

6.34.6.3. Highly toxic substances.

6.34.6.4. Division 6.2 infectious substances which require technical escorts and/or special protective equipment.

6.34.6.5. Nuclear weapons.

6.34.6.6. Class 7 radioactive material (Yellow III label).

6.34.6.7. All other hazardous materials, except class 9 and Other Regulated Materials-Domestic (ORM-D) when aggregate gross weight exceeds 1,000 pounds (454 kgs).

6.34.7. Departure/Arrival Notifications.

6.34.7.1. Prior to departure, verify airfield controlling agency.

6.34.7.2. Forward hazardous materials information to emergency response agencies.

6.34.7.3. Include hazardous materials information in the departure message, if required.

6.34.7.4. If ETA is less than 1 hour, or other circumstances preclude message receipt at destination, provide hazardous information by priority telephone.

6.34.7.5. At least 30 minutes prior to ETA, check with destination to verify that hazardous material notification information, if required, was received.

6.34.7.6. If not, unless prohibited by the theater commander or FLIP planning, contact controlling agency at destination and, at a minimum, provide:

6.34.7.6.1. PSN.

6.34.7.6.2. Hazard class.

6.34.7.6.3. UN, NA, or ID number.

6.34.7.6.4. NEW for Class 1 (explosives).

6.34.7.6.5. Net quantity of chemical ammunition and toxic substances.

6.34.8. Aircraft Parking.

6.34.8.1. Parking of aircraft carrying hazardous materials is the responsibility of the host airfield.

6.34.8.2. The following is provided for information only:

6.34.8.2.1. Aircraft transporting Division 1.1 and 1.2 explosives, nuclear weapons, and Hazardous Materials requiring a SAAM, i.e., Toxic Chemical Ammunition, are normally parked at remote (hot cargo) spots.

6.34.8.2.2. Division 1.3 and 1.4 explosives may or may not require hot cargo parking depending on quantity of explosives.

6.34.8.2.3. Transient aircraft with explosives, when cargo is not handled, may be parked at isolated locations other than hot cargo spots.

6.34.8.2.4. Other hazardous materials normally do not require remote or isolated parking.

6.34.8.2.5. Military installations are responsible for proper placarding of aircraft.

**6.35. Hazardous Medical Equipment.**

6.35.1. Nonstandard equipment possessed by medical facilities that use ACC air evacuation services should be regarded as potentially hazardous. Two types of equipment are of major concern:

6.35.1.1. Electronic medical equipment produces electromagnetic interference (EMI) which is commonly beyond the limits specified by MIL STD 461A and 462, and therefore can interfere with aircraft communication and navigational equipment.

6.35.1.2. Therapeutic oxygen systems present an increased hazard of fire or explosion. A potential hazard is the inadvertent disruption of the cylinder neck, manifold, or regulator resulting in explosion and propulsion of the container or accessories.

6.35.2. For nonstandard electronic medical equipment, take the following precautions:

6.35.2.1. Pararescue or medical personnel must inform the PIC when nonstandard electronic medical equipment is brought on board the aircraft.

6.35.2.2. The PIC must be informed of the anticipated period of use of the equipment during the mission.

6.35.2.3. The PIC must be alert for any interference with aircraft communications or navigation equipment during periods of use of this equipment.

6.35.2.4. When continuous use of the equipment is required throughout the duration of the mission, flight must be restricted to VFR conditions. Furthermore, exercise additional caution on night VFR missions to ensure there are no adverse effects on navigational equipment.

6.35.3. For nonstandard oxygen equipment, take the following precautions:

6.35.3.1. All compressed oxygen equipment with exposed, unprotected cylinder neck, manifold, or regulator must be completely secured from all movement in its longitudinal and lateral axes.

6.35.3.2. Pararescue or medical personnel must continually monitor the operation of the equipment to detect possible malfunction during exposure to altitude.

## *Section 6D—Departure*

**6.36. Departure Briefing. (T-1)** The pilot making the takeoff will brief the crew in accordance with published MAJCOM briefing guides.

**6.37. Departure Monitoring. (T-1)** The navigator and PM will back up the pilot and report any deviations from the planned departure.

**6.38. NVG Departures.**

6.38.1. NVG Departure Weather Minimums. Pilots may use NVGs to assist in instrument takeoffs as mission requirements dictate. Current mission-qualified pilots may fly NVG departures IAW AFI 11-202V3 departure weather minimums. Crews must consider weather conditions, moon illumination and position, sky glow at dawn and dusk, cultural lighting, and weapon/expendable effects when planning NVG operations.

6.38.2. NVG Malfunctions during Takeoff. During an NVG takeoff, if the PF experiences NVG failure, the takeoff may be continued at the discretion of the PIC. The PM must be ready to immediately assume aircraft control if the PF experiences spatial disorientation or an NVG malfunction. See AFTTP 3-3.HC-130 for additional NVG emergency information.

## *Section 6E—En Route*

**6.39. Checklists. (T-1)** Accomplish all checklists with strict discipline. A checklist is not complete until all items are accomplished.

6.39.1. The pilot flying the aircraft will initiate all checklists unless the flight manual or this instruction dictates otherwise.

6.39.2. Carry abbreviated checklists in the USAF Flight Crew Checklist binders. The only pages (or inserts) authorized in checklist binders are C-130 series T.O. aircrew checklists, MAJCOM approved checklists (includes changes/updates), briefing guides, and approved information guides. Units may construct locally approved in-flight guides.

6.39.3. Crew members may make personal notes in pencil on checklists, briefings, or information guides, if desired. Such notes must be current.

6.39.4. Abbreviated checklist items that do not apply to unit aircraft or mission need not be challenged during checklist accomplishment.

**6.40. Flight Progress.** Use all available navigation aids to maintain course centerline and a positive fix on the aircraft's position. Immediately report to the controlling radar facility any malfunction or loss of navigational capability that may degrade navigational accuracy.

**6.41. Navigational Aid Capability.** Airspace and associated navigational aid equipment capability are rapidly evolving. Crews must maintain an in-depth knowledge of current FLIP requirements/policies.

6.41.1. Reduced Vertical Separation Minimum (RVSM) Airspace. Airspace where RVSM is applied is considered special qualification airspace. The specific aircraft type must be approved for operations in these areas. Refer to FLIP AP/2 for additional requirements.

6.41.2. Required Navigation Performance (RNP) Airspace and Basic Area Navigation (BRNAV) Airspace. Pilots will immediately notify ATC if any of the FLIP or International Civil Aviation Organization (ICAO) required equipment fails after entry into RNP or BRNAV airspace (T-0).

**6.42. Flight Deck Entry. (T-1)** The following personnel are authorized on the flight deck during takeoff, landing, and critical phases of flight. They must be in compliance with **Chapter 3**.

6.42.1. Additional crewmembers (if seats are not required by primary crewmembers, instructors, or flight examiners).

6.42.2. Individuals approved by the group commander. ***NOTE***: Does not include non-instructor aircrew members. ***NOTE:*** The PIC may authorize passengers (except patients) to visit the flight deck during non-critical phases of flight. Passenger access to any primary crew station is prohibited.

**6.43. Cockpit Congestion and Loose Objects. (T-1)**

6.43.1. Limit the number of persons on the flight deck to the minimum commensurate with mission requirements. At no time will this exceed nine.

6.43.2. Keep the flight deck uncluttered and orderly for all flight and ground operations.

6.43.3. Do not place any item (checklist, chart, etc.) on the center pedestal in a position that covers or hides from view any switch, light, or gauge. Do not place any item behind the condition levers or on the throttle quadrant.

6.43.4. Do not place any item (checklist, chart, etc.) on the flight deck glare shield.

6.43.5. Do not hang any item on the flight deck escape ladder higher than the second from the bottom rung.

6.43.6. Do not store any items not required for use or immediate reference in-flight on the flight deck.

**6.44. In-flight Meals.** The pilot and copilot should not consume meals at the same time and their meals should consist of different menu items.

**6.45. Duty Station. (T-1)** Both pilots shall be in their seats during flight. One of the pilots may be out of their seat for brief periods to meet physiological needs. With both pilots in their seats, PIC's may authorize rest periods IAW AFI 11-202V3 for one pilot occupying a primary duty station during non-critical phases of flight (the other pilot will be awake and alert). Only one pilot, or the flight engineer, may be absent from their duty station at a time. Notify the PIC prior to departing assigned primary duty station. ***NOTE:*** Critical phases of flight are defined as takeoff, approach and landing, and all tactical mission events.

**6.46. Communications Instructions Reporting Vital Intelligence Sightings (CIRVIS) and Other Reports.** Report all vital intelligence sightings from aircraft as indicated in FLIP planning or FLIP Enroute Supplement.

6.46.1. In-flight harassment or hostile action against aircraft. Aircraft subjected to harassment or hostile action by foreign aircraft will immediately contact the nearest USAF air and ground voice facility and report the encounter. Include aircraft nationality, type, insignia, or any other identifying features; note position, heading, time, speed when harassed, the type of harassment and request relay of the report to the nearest C2 agency. Also, attempt to contact the nearest command post when in UHF and VHF range.

6.46.2. Other incidents will be reported as indicated in AFI 10-206, *Operational Reporting.*

**6.47. Communications Policy (T-1).**

6.47.1. Aircraft Interphone: All crewmembers will monitor interphone. Crewmembers will notify the PIC before going off and when back on headset.

6.47.1.1. Do not discuss classified information on the interphone during radio transmissions.

6.47.1.2. Classified interphone or radio transmissions will be recorded on the cockpit voice recorder (CVR) if it is operating. Ensure the CVR remains on and running for 30 minutes until the tape is clear of any recorded classified conversations. If classified information is discussed while the FLIR voice recorder is used in flight, the VHS tape must be turned into Intel to be classified upon landing. If en route, have the classified courier maintain the VHS tape until the tape has been properly classified.

6.47.1.3. Non-aircrew members may monitor interphone or radio transmissions only when specifically approved by the PIC. The PIC will ensure the communications policy is briefed to these personnel prior to flight. The PIC must ensure no one monitors classified information for which they are not cleared or transmits classified information over the radios.

6.47.2. Command Radios. Make all communications IAW FLIP or as directed by the controlling agency.

6.47.2.1. The pilot operating the command radios will inform the crew which radio is primary.

6.47.2.2. The PM normally makes all primary radio calls.

6.47.2.3. All crewmembers will monitor the primary radio unless specifically directed to do otherwise by the PIC or subsequent chapters of this instruction. If the crew does not have an AMSS, the PIC will designate crewmembers required to monitor the HF and/or SATCOM radio.

6.47.2.4. During emergencies, monitor simultaneous UHF and VHF transmissions, if able, when operating in a terminal area under radar control.

6.47.2.5. One of the pilots will record and read back all ATC clearances. The navigator or AMSS will record the clearance and monitor the read back. This includes all transmissions pertaining to ATC instructions involving departure, en route, and approach procedures. This may be disregarded when ATC instructions require immediate execution, or when such action interferes with timely completion of more important duties.

**6.48. In-flight Emergency (IFE) Procedures.** Report deviations from directives that occur as a result of an emergency, in accordance with AFI 11-202V3 and this instruction.

6.48.1. Notification of Controlling Agencies. As soon as practical after completing the aircraft emergency action checklist, furnish the controlling agency and appropriate Command and Control Center (CCC) a description and extent of the difficulty, assistance required, intentions, and any further pertinent information.

6.48.2. The PIC may initiate a CONFERENCE HOTEL when additional expertise is necessary to cope with emergencies or other conditions. It convenes at the lowest level where expertise is available, and will not be elevated for the purpose of keeping the next higher echelon informed. **Table 6.6** lists CONFERENCE HOTEL contact information extracted from AFI 11-418, *Operations Supervision*. See AFI 11-418, for further details.

**Table 6.6. Conference HOTEL Contact Information.**

| TIME | PROCEDURE | CONTACT | POCs: |
|---|---|---|---|
| 24 HOURS: | Call Lockheed Martin Technical Representative: | DSN: 625-9001, or<br><br>Comm: (770) 494-1705 | Steve Horbath<br><br>Mark Neas<br><br>Wayne Roberts |
| NON-DUTY HOURS: | Call Robins Command Post and ask for home phone numbers for above personnel. Robins Command Post will maintain a current listing of home telephone numbers for POCs. | DSN 497-2612/13/14/15.<br><br>Commercial: (478) 327-2612/13/14/15 | |

6.48.3. When in UHF or VHF range, initiate the conference over appropriate discrete frequencies. When out of VHF or UHF range, use HF radios to establish a phone patch with the nearest or controlling CCC. Provide a narrative description of the situation including actions taken, intentions, and type of expertise desired.

6.48.4. Turnaround Procedures. When a turnaround is necessary, use procedures in FLIP. Maintain VFR, reverse course, climb or descend to a VFR altitude or flight level and request ATC clearance. If unable to maintain VFR, obtain an ATC clearance before reversing course. A turnaround under IFR conditions, without ATC approval, will be made only after a thorough evaluation of the seriousness of the emergency, general traffic density, and known traffic operating in the immediate area. Normally, a climb or descent (with minimum change in altitude) to a VFR altitude or flight level will result in minimum exposure to other aircraft, if a turnaround is required.

6.48.5. Continued Flight with Engine Loss. (T-1) A flight may proceed on three engines to its destination if two-engine capability exists, favorable operating conditions prevail both en route and at the point of intended landing, and a suitable alternate airfield is available at all times. The flight engineer will inform pilot of charted two-engine range. If these conditions cannot be met, the flight will terminate at the nearest facility (preferably military) which, in the judgment of the PIC, offers safe and favorable operating conditions.

**6.49. Need for Medical Assistance.** When a person on board the aircraft requires medical care, the PIC will inform the station of next intended landing in sufficient time so medical personnel may meet the aircraft. The request will include the individual's sex, approximate age, and the nature of the medical problem.

**6.50. Weather Forecasts.** For authorized weather sources, refer to AFH 11-203V2, *Weather for Aircrews*, the Flight Information Handbook (FIH) or use a published MAJCOM-approved source. See the FIH for additional information and OWS geographic areas of responsibility.

6.50.1. For all flights outside the local area, the AMSS will obtain the destination and alternate (if applicable) forecasts, to include pressure altitude and temperature, before reaching the equal time point and one hour prior to ETA.

6.50.2. Obtain latest weather prior to descent for landing at destination.

***Section 6F—Arrival***

**6.51. Descent. (T-1)** Crews should plan and initiate their descent in order to comply with ATC arrival and instrument approach procedures. Primary crewmembers will not be involved in duties other than aircraft operations, descent and approach monitoring, and required checklist items from the initial descent point to landing. The PM and navigator will monitor the approach and report any deviations from prescribed procedures.

6.51.1. Before descent into unfamiliar areas, pilots and navigators will review appropriate terrain charts to increase aircrew situational awareness of obstructions.

6.51.2. Night and Marginal Weather Operations. Fly a precision approach, if available, at night or during marginal weather. If a precision approach is not available, fly any available approved instrument approach. Visual approaches may be flown during night VFR conditions, if an approved instrument approach is not available or operational/training mission requirements dictate.

**6.52. Cold Weather Altimeter Setting Procedures.** Apply cold weather altimeter corrections for non-tactical situations in accordance with AFI 11-202V3. For tactical operations, see **Chapter 15.**

**6.53. Radar Altimeter Procedures. (T-1)** Pilots and navigators will crosscheck radar altimeters during descent to ensure adequate terrain clearance is provided throughout the descent and maneuvering portion of the approach. Once established in a VFR traffic pattern, the radar altimeter may be set at the discretion of the pilot.

**6.54. Instrument Approach Procedures.** Comply with AFI 11-202V3 and the following:

6.54.1. The C-130 is a category "C" aircraft. If approach speeds exceed 140 knots, the minimums for Category "D" will be used. DH/MDA, instrument approach visibility and, if required, ceiling minimums will be as published, with the following exceptions:

6.54.2. If full flight instrumentation is not operational, base DH on a minimum HAT of 300 feet and RVR 4000, or visibility three-fourths mile if RVR is not available.

6.54.3. Full flight instrumentation for an ILS includes:

6.54.3.1. Dual flight displays [one flight director plus ADI repeat satisfies this requirement].

6.54.3.2. Complete differential pressure instruments, compass/heading reference systems, and attitude indicators in the pilot and copilot positions.

6.54.4. Full flight instrumentation for a PAR will include: complete differential pressure instruments, compass systems/heading reference systems, and attitude indicators in both pilot positions.

6.54.5. Aircrews performing approaches and landings at locations where temperatures are 0 degrees centigrade or below will refer AFI 11-202V3 and the Flight Information Handbook, section D, Temperature Correction Chart.

**6.55. Precision Approach.** Visibility will be no lower than RVR 2400 or one-half mile if RVR is not available. DH will be based on a HAT of no less than 200 feet.

**6.56. Circling Approach.** Minimum descent altitude (MDA) will be as published for category aircraft. If the minimums are not published by category, the minimum altitude will be as published, but in no case lower than the value indicated below, plus the published airport elevation:

6.56.1. Category C. 500 feet - 1 1/2 SM

6.56.2. Category D. 600 feet - 2 SM

**6.57. Coupled Approach Procedures.** When a coupled approach is flown, assume manual control at or above published minimum altitude (MDA/DH).

**6.58. NVG Approach and Landing.**

6.58.1. NVG Approach Weather Minimums. Current mission qualified pilots may fly IFR approaches with weather at approach minimums.

6.58.2. NVG Malfunction during Approach and Landing. If one of the pilots experience NVG failure on short final, it will be at the discretion of the PIC to transition to normal lights or perform a go-around. The PM must be ready to immediately assume aircraft control if the PF experiences spatial disorientation or an NVG malfunction.

***Section 6G—Post Flight***

**6.59. Maintenance Documentation (T-1).** Complete the AFTO Form 781 after each flight. After landing, crewmembers debrief maintenance personnel on the condition of the aircraft, engines, avionics equipment, and all installed special equipment as required.

6.59.1. The PIC will review the aircraft forms, determine those discrepancies considered as mission essential, and indicate them by entering "ME" in block letters in the lower left hand corner of the AFTO Form 781A, **Maintenance Discrepancy and Work Document** discrepancy block. Use "MC" (mission contributing) to indicate any discrepancies that, if not corrected, would substantially affect mission accomplishment, but are not mission essential. At stations where there is no maintenance, and maintenance support is required, the PIC will ensure a thorough debrief is provided to the controlling CCC prior to entering crew rest.

6.59.2. Ensure flight time, landings, aircraft condition, and fuel onloaded/off-loaded during refueling operations is entered in the AFTO Form 781H.

**6.60. Salt Spray and Clear Water Rinse. (T-3).** The accumulation of salt spray on windshields and side windows is a hazard that must be considered for low-level overwater flight. Weigh this against mission urgency prior to descent below 500 feet, when heavy seas or high surface winds exist. In some cases, it will be preferable to fly at a higher altitude to avoid this condition. An entry will be placed in the AFTO Form 781A, "Aircraft Subjected to Salt Spray" (state lowest altitude and duration) anytime the aircraft is flown under 1000 feet above sea level except for takeoffs and landings Clear water rinse facility (birdbath) usage guidelines are as follows:

6.60.1. Crews should use a clear water rinse facility (birdbath) after every flight in which the aircraft is flown over salt water below 1000' AGL, including tactical approaches and landings. Multiple instrument approaches do not require a clear water rinse, unless, in the judgment of the crew, the aircraft was subjected to salt spray. If a birdbath facility is unavailable make the following annotation in the AFTO form 781A, "aircraft subjected to salt spray, birdbath unavailable" The following guidance will be used to maximize the effectiveness of the birdbath and to ensure safe operations.

6.60.2. Crews will ensure that sensors such as the radar/IDS are off prior to entering the birdbath.

6.60.3. The GTC, ATM, ATM generator, and APU will remain off with doors closed to prevent flameout and flooding of the GTC/APU compartment.

6.60.4. Set flaps to 100% and switch off and extend both auxiliary and normal landing lights (if applicable).

6.60.5. All four engines should be at normal ground idle with the lowest power setting available. Two engines in normal ground idle, and two in LSGI may be used if aircraft weight does not restrict the forward movement through the bath.

6.60.6. As full water spray begins, start taxiing slowly on centerline at a rate which allows adequate rinsing of the entire aircraft. Hold nose wheel steering centered and start windshield wipers. Exercise flight controls while in the birdbath. Complete the AFTER LANDING Checklist after rinse is completed, run engines at normal ground idle for a minimum of two minutes to aid in drying out engine nacelles.

6.60.7. Review local procedures for birdbath operating guidelines. Each birdbath is unique in design and function and local procedures such as direction of entry, wing tip clearance criteria, noise abatement concerns, etc. need to be reviewed prior to its use. ***CAUTION*:** It is possible to experience an overheat indication during or immediately following the birdbath due to water intrusion into the overheat warning systems. Each crew will have to analyze the indication and make a judgment as to the emergency action to be taken.

6.60.8. For units flying aircraft equipped with LAIRCM Small Laser Turret Assemblies (SLTA) do not utilize the bird bath with the Group B (turrets) installed due to water intrusion problems with the SLTA, MC/HC-130s. This does not preclude using the birdbath when the aircraft is configured with Group A (turrets removed and plates installed) only.

***Section 6H—Miscellaneous Procedures***

**6.61. Impoundment of Aircraft. (T-1)** If an aircraft is involved in a serious in-flight incident, the PIC shall impound the aircraft immediately after landing IAW AFI 21-101 and contact the controlling C2 agency for further instructions. If at an Air Force installation, the PIC shall request impound from the appropriate maintenance authority.

**6.62. Support Agencies. (T-1)** The PIC or a designated representative will pass significant information to support agencies, such as weather, ATC, or base operations. The actual weather encountered should be compared to forecast weather, and this information provided to weather personnel to facilitate improved support. Debrief intelligence, when applicable.

**6.63. Crew Debriefing. (T-1)** The PIC will conduct a debriefing after each mission. The debriefing will include all applicable crewmembers so that common problems can be discussed and resolved. Crewmembers may be excused from debrief at the discretion of the PIC.

**6.64. Aircrew Notification Procedures. (T-1)** When transiting installations, the PIC will establish a point of contact with the CCC, base operations, or local airport manager when the crew is billeted in off-base quarters. The PIC will be notified immediately in case of incident or emergency affecting the safety or security of the aircraft.

**6.65. Dropped Objects. (T-1)** During aircraft exterior visual inspections, pay particular attention to surfaces, panels, and components, which could potentially be dropped objects. If a dropped object is discovered and the mission is continued, the flight crew will:

6.65.1. Ensure a write-up is entered in the AFTO Form 781A.

6.65.2. Notify the Command Center as soon as practical. Include route of flight, altitude, and weather conditions (i.e., turbulence, etc.).

**6.66. Border Clearance.** The border clearance responsibility will be as designated by the base or area command specified in DOD directive *4500.09E,Transportation and Traffic Management*, *DOD 4500.54E*, *Foreign Clearance Program* as well as implementing guidance to the FCP set out in the Foreign Clearance Manual and the Foreign Clearance Guide at **https://www.fcg.pentagon.mil**/ in addition to other United States Entry Requirements and Related Areas.

6.66.1. Normal Operations. The unit dispatching the mission is normally responsible for the border clearance of its aircraft. When support is not available, border clearance is the responsibility of the PIC. Duties may be assigned to ground personnel or to the loadmaster, but the PIC retains ultimate responsibility. When an aircraft is on-loaded at a base without an air traffic function, the PIC is responsible for ensuring the following:

6.66.1.1. Crewmembers and passengers possess current passports and valid visas, if required.

6.66.1.2. Crewmembers and passengers have current shot records or certificates of immunization.

6.66.1.3. Cargo entry documents are in proper order.

6.66.1.4. Departure or arrival to the US is through a port of entry where border clearance can be obtained.

6.66.1.5. Border clearance for aircraft cargo, passengers, crew and baggage, if required, is obtained before takeoff to a foreign area, or after arrival from a foreign area.

6.66.1.6. If required, accomplish Aircraft spraying IAW **paragraph 6.70**

6.66.1.7. En route to the US, the loadmaster has distributed personal customs declarations to all passengers and crewmembers; has briefed passengers and crewmembers on customs regulations; and has prepared and compiled necessary border clearance forms for the PIC's signature.

6.66.1.8. All aircraft and passenger garbage will be collected and placed in tight leak-proof, covered container(s.) A doubled lined trash bag at least 3 mil (0.003 inch) thick with an airtight knot will suffice. All plant and agricultural bi-products are considered prohibited (e.g. fruits, vegetables) unless packaged, authorized, and cleared for importation into the US. All garbage will be turned over for disposal to the authorized agent.

6.66.1.9. En route to the US, the base of intended landing is notified of any change in ETA, to ensure border clearance is accomplished as soon as possible after landing.

6.66.1.10. A Permit to Proceed is obtained when the mission requires an aircraft, which has landed in the US for customs clearance, to proceed to another US base to obtain border clearance. The permit delays customs inspection of cargo, passengers, and crew until arrival at the offload station, saving intermediate offloading and reloading normally required for customs inspection. The Permit to proceed is valid only to the airport of next landing, where the border clearance must be completed, or a new permit obtained. Do not make intermediate stops unless required by an emergency situation, or directed by C2 authority.

6.66.1.11. When an aircraft lands for a US border clearance, a US Customs representative normally meets the aircraft to obtain the required documents. Do not deplane passengers or crewmembers, except a scanner to install chocks and gear pins, unless necessary for safety. Do not unload until approved by customs and agriculture personnel or their designated representatives. This procedure applies to the initial landing in the US and all subsequent landings until crew, passengers, and cargo complete final border clearance.

6.66.2. Exercise and Contingency Operations.

6.66.2.1. General. Certain missions, which do not transit normal ports of entry or exit, require special procedures to expedite compliance with customs, public health, immigration, and agricultural requirements. A joint memorandum of understanding establishes procedures and waivers.

6.66.2.2. Implementation. Traffic and border clearing agencies implement all or part of the agreement as necessary for each operation. Inspection and clearance may be accomplished at the CONUS onload or offload base instead of the normal port of entry, or at the foreign onload or offload base.

**6.67. Customs Procedures.** See DOD 4500.9-R, *Defense Transportation Regulation, Part V, Customs* and other United States Entry Requirements and Related Areas.

6.67.1. Outbound. No requirements. CBP Form 7507, **General Declaration (Outward/Inward) Agriculture, Customs, Immigration and Public Health**, is waived.

6.67.2. Inbound. Prepare one copy of the following documents before arrival.

6.67.2.1. CBP Form 7507 (passenger list not required).

6.67.2.2. Cargo manifest.

6.67.2.3. For troops out of country less than 140 days.

6.67.2.3.1. Troop commander’s certificate from examination of troop baggage.

6.67.2.3.2. One copy of CBP Form 6059B, **Customs Declaration**, for each passenger not under command of the troop commander, to include observers, support personnel, civilians, news reporters, and crewmembers.

6.67.2.3.3. Upon arrival at a CONUS offload base, a Customs representative meets the aircraft and accepts the troop commander's certificate with respect to troop baggage. Individual baggage declarations are not required. The troop commander should have inspected troop baggage. Troops debark under the observation of the Customs representative with only a spot check of articles and baggage. The Customs officer may elect to make a more extensive inspection.

6.67.3. For troops out of the country 140 days or more.

6.67.3.1. One copy of DD Form 1854, **Customs Accompanied Baggage**, or CBP Form 6059B for each passenger. This includes observers, support personnel, civilians, news media personnel, and crewmembers.

6.67.3.2. Upon arrival at a CONUS offload base, a Customs representative meets the aircraft and collects all declarations. Troops debark under the observation of the Customs representative, who may make discretionary examination of the baggage.

6.67.4. Immigration Procedures.

6.67.4.1. Outbound. No requirements.

6.67.4.2. Inbound. Submit one copy of CBP 7507 to the Immigration inspector.

**6.68. Customs, Immigration, and Agricultural Inspections.**

6.68.1. Obtain Customs, Agriculture, and Public Health clearance, as required, prior to opening any doors, hatches, or windows, other than the crew entrance door, or enplaning and deplaning personnel.

6.68.2. Proceed directly from the aircraft to Customs, Immigration, or Agricultural inspection for processing when required by the inspector.

6.68.3. US military aircraft are sovereign territory. When cleared to over fly or land in foreign territory, it is US policy to assert that military aircraft are entitled to the privileges and immunities which customarily are accorded to warships. Privileges and immunities include, in the absence of stipulations to the contrary, exemption from duties and taxation; immunity from search, seizure, and inspections (including customs and safety inspections); or other exercise of jurisdiction by the host nation over the aircraft, personnel, equipment, or cargo on board. The PIC will not authorize search, seizure, inspection, or similar exercises of jurisdiction enumerated above by foreign authorities except by direction of HQ USAF or the U.S. Embassy or Consulate in the country concerned. (T-0).

6.68.4. **(T-0)** The PIC will not permit the inspection of their aircraft by officials of any foreign government. The PIC and crew will deny access and seek aid from the senior ACC (or other USAF) representative, US Embassy, or Consulate within the host nation. Customs or other officials will be informed of the above policy and requested to confirm their request through their own government and with US Department of State representatives. If necessary, the crew will seal the aircraft, the crew entered into crew rest, and departure intentions will be canceled until resolution of the matter by the appropriate authority. Inform C2 authorities by the fastest available means should this situation occur.

6.68.5. When confronted with a search request by foreign authorities, aircrews should consider the following procedures:

6.68.5.1. In most cases, search attempts may be stopped by a statement to the foreign officials that the aircraft is sovereign and not subject to search without consent of HQ USAF or the chief of mission in the country concerned. This should be clearly conveyed in a polite manner so as not to offend foreign authorities that may honestly, but mistakenly, believe they have authority to search USAF aircraft.

6.68.5.2. If foreign authorities insist on conducting a search, PICs must negotiate to delay the search until contact is made with HQ USAF or U.S. Embassy or Consulate within the host nation. The PIC should unequivocally state that they have no authority to consent to the search and that they must relay the host nation request to these agencies for decision. The PIC should then notify these agencies of the request by the most expeditious means available. Thereafter, the PIC should follow instructions provided by the U.S. Embassy or Consulate within the host nation and HQ USAF.

6.68.5.3. If foreign officials refuse to desist in their search request, the PIC should indicate that they would prefer to fly the aircraft elsewhere (provided fuel and mechanical considerations permit a safe departure) and request permission to do so.

6.68.5.4. If permission is refused and the foreign authorities insist on forcing their way on board an aircraft, the PIC should state that they protest the course of action being pursued and that they intend to notify both the U.S. Embassy or Consulate and HQ USAF of the foreign action. The PIC should then allow the foreign agents onboard the aircraft, without physical resistance, and thereafter report the incident to HQ USAF and appropriate embassy, as soon as possible.

6.68.5.5. In all instances, specific instructions may be briefed because of sensitive cargo or equipment. These instructions and applicable provisions of classified supplements to the FCG should be followed, where applicable.

**6.69. Military Customs Preclearance Inspection Program.**

6.69.1. The military customs program was developed to assist the DOD and other US Government agencies in the control of narcotics, contraband, and prohibited agricultural products, and to expedite entry of DOD personnel and material into the customs territory of the United States. See DOD 4500.9-R.

6.69.2. Military Customs Inspectors will accomplish this inspection immediately prior to departure and may conduct more than one preclearance inspection on CONUS-bound aircraft. When security considerations necessitate deviation from this policy, mission planners must coordinate with the appropriate agency to ensure the mission is not jeopardized.

**6.70. Insect and Pest Control (Aircraft Spraying). (T-0).** PICs will ensure required spraying is accomplished in accordance with AFI 32-1053, paragraph 3.5.3.6.3., *Integrated Pest Management Program* (23 Jun 2009). Also, consult the DOD Electronic Foreign Clearance Guide (**https://www.fcg.pentagon.mil/fcg.cfm**) *referenced* in AFI 16-606, *Foreign Clearance Program* (21 January 2011), paragraph 2.1.1., for country specific quarantine clearance requirements. Consult Armed Forces Pest Management Board TG No. 31 (February 28, 2012) for specific guidance on aircraft public health preparation for deployment and redeployment. Spraying will also be IAW *AFJI 48-104*, *Quarantine Regulations of the Armed Forces*, January 24, 1992, DOD 4500.54E (December 28,2009). Certify the spraying on Customs Form 7507, or on forms provided by the country transited. Aircraft should never be sprayed with passengers on board. The only exception is when mandated by DOD 4500.54E.

6.70.1. When spraying is required, use insecticide, aerosol d-phenothrin-2 percent, NSN 6840-01-067-6674 (or equivalent), to spray the aircraft. Wear leather or Nomex gloves while spraying.

6.70.1.1. Direct the nozzle toward the ceiling of the compartment or space being sprayed.

6.70.1.2. Spray spaces inaccessible from within the aircraft after completely loading fuel, baggage, cargo, and passengers, including baggage compartments, wheel wells, and other similar spaces.

6.70.1.3. Spray the cabin, cockpit, and other spaces accessible from within the aircraft after the crew is aboard and after closing all doors, windows, hatches, and ventilation openings. ***CAUTION:*** If the insecticide label directs disembarkation after use, spray before boarding crew or passengers. Close all doors and hatches for 10 minutes after dispensing and ventilate for 15 minutes before allowing anyone on board.

6.70.1.4. Spray for 105 seconds unless longer periods are specified for the country being transited. ***NOTE:*** Keep used aerosol cans separate from other trash so they may be disposed of safely.

6.70.2. Responsibility of PIC In-flight. When seeing any insect or rodent infestation of the aircraft in-flight, notify the destination C2 center, airfield management operations, or airport manager of the situation before landing so the proper authorities can meet the aircraft.

6.70.3. Procedure at Aerial Port of Disembarkation (APOD). On arrival, do not open cargo doors or hatches except to enplane officials required to inspect the aircraft for insect or rodent infestation. Do not onload or offload cargo or passengers until the inspection is satisfactorily completed. This procedure may be altered to satisfy mission or local requirements, as arranged by the base air terminal manager or the local C2 organization.

# Chapter 7

## AIRCRAFT SECURITY

**7.1. General.** This chapter provides guidance on aircraft security, in-flight and on the ground. Aircrews must make every reasonable effort to resist an aircraft hijacking. Resistance may vary from dissuasion to direct physical confrontation, including the use of weapons. Due to the sensitive nature of anti-hijacking procedures, crewmembers should reference AFI 13-207, *Preventing and Resisting Aircraft Piracy (FOUO)* and the FIH for specific guidance. Aircrews will not release any information concerning those procedures or hijacking attempts.

**7.2. Security.** HC-130 aircraft are Protection Level 3 resources. This security priority designation applies to operational aircraft, wherever they are located, worldwide. Some aircraft contain equipment and documents that require protection per DOD 5200.1-R, *Information Security Program* and AFI 31-401, *Information Security Program Management*.

**7.3. Procedures. (T-1)** The planning agency must ensure that adequate en route force protection is available. The amount of force protection required will vary, depending on location and ground time. PICs will receive a threat assessment and force protection capability evaluation briefing at home station prior to departure and receive updates en route, if required. During both scheduled and unscheduled landings at non-USAF installations, The PIC will assess the force protection situation and take the following actions, if force protection capability appears insufficient:

7.3.1. Area Patrol. Request area patrol coverage from local security forces to include back-up response forces. If local authorities request payment for this service, use AF Form 15, **United States Air Force Invoice**.

7.3.2. Aircrew Surveillance. The PIC will direct armed personnel to remain with the aircraft and maintain surveillance over aircraft entrances and activities in the vicinity of the aircraft. Obtain a means to report suspicious or hostile activity to security forces (e.g., land mobile radio, etc.).

7.3.3. Locations with Unacceptable Security. If local security forces are unacceptable or unavailable and the crew is not augmented with security forces, the PIC may waive FDP restrictions and depart as soon as possible for a destination with adequate force protection. If unable to depart the location due to system malfunction, coordinate through home station channels to acquire force protection support.

7.3.4. Unauthorized Entry. If, in the PIC's judgment, the aircraft needs to be locked and sealed as a measure to detect unauthorized entry:

7.3.4.1. Use the aircraft lock. ***NOTE:*** The aircraft will be locked during all off-station missions remaining overnight.

7.3.4.1.1. If the aircraft lock is unavailable, secure the hatches and doors in a manner that will indicate unauthorized entry. For example, tape inside hatch release handles to the airframe, so that entry pulls the tape loose. Close and seal the main crew entrance door using a boxcar seal or other controllable device to identify forced entry. Wipe the immediate area around the seal clean to help investigate forced entry. If the seals are damaged or have been tampered with, notify the appropriate local authorities, the controlling agency, and inspect the aircraft thoroughly.

7.3.4.2. Coordinate with the local base operations representative on procedures for servicing the aircraft while the crew is away. If a padlock is used, the key or combination will be left with base operations or the representative for servicing and maintenance personnel.

**7.4. Protective Standards for Aircraft Carrying Distinguished Visitors.** This paragraph applies specifically to aircraft transporting DVs Code 4 or above. The PIC is responsible for aircraft security at en route stops.

7.4.1. DOD Installations. Notify base security forces of estimated arrival and departure times. Request security forces maintain continuous security surveillance during the entire ground time. If the installation is unable to comply, arrange for the best protection available.

7.4.2. Non-DOD Installations. Contact the airport manager or installation commander to arrange for force protection. If available security is inadequate, purchase additional security using AF Form 15.

**7.5. Arming of Crewmembers. (T-1)** When directed, at least one crewmember each from the flight deck and cargo compartment will carry weapons. All crew members will know who is armed.

7.5.1. Issue. Before departing home station, authorized crewmembers will obtain weapons, ammunition, lock, and key. Crewmembers must present a current AF Form 523, **USAF Authorization to Bear Firearms**, to be issued a weapon. Crewmembers will be reissued the same weapon until the mission terminates at home station. If an armed crewmember must leave the crew en route, transfer the weapon to another authorized crewmember, using AF Form 1297, **Temporary Issue Receipt**.

7.5.2. Loading and Transfer of Weapons. Load and unload weapons at approved clearing barrels if available. To transfer a loaded weapon to another crewmember, place the weapon on a flat surface. Do not use a hand-to-hand transfer.

7.5.3. Wearing of Weapons for anti-hijack purposes. Wear weapons in a holster, concealed at all times to protect the identity of armed crewmembers. Do not wear weapons off the flight line, except to and from the CCC, armories, and other facilities associated with aircrew activities such as base operations, fleet service, cargo or passenger terminals, flight line cafeterias, snack bars, etc.

7.5.4. Due to the dynamic nature of contingency and combat operations, unit commanders may designate all aircrew as arming group A for the purpose of aircraft/resource protection for the following weapons: M-9, M-4/M-16 or equivalent, and M-870, IAW AFI 31-207 and AFI 36-2226, *Combat Arms Program*.

7.5.5. Weapons Storage In-flight. Crewmembers will be armed before beginning preflight or onload duties. When no passengers are on board and after a satisfactory stowaway check, weapons may be stored in the gun box in-flight. Crewmembers will rearm before landing. Weapons need not be unloaded before being placed in the gun box.

7.5.6. Weapons Storage on the Ground. Aircrews, including stage crews, will store weapons and ammunition in the most secure facility available, normally the base armory. If a weapons storage facility is unavailable or the country prohibits or restricts the entry of weapons, secure firearms and ammunition in the locked gun box. Inform command and control agency which crewmember has the gun box key (or combination).

7.5.6.1. Aircraft without a Gun Box. If an aircraft without a gun box must remain overnight at a location where a government-owned storage facility is unavailable, use the nearest acceptable facility. Acceptable storage facilities are US or Allied military services armories, US National Guard and Reserve armories, and US civil law enforcement armories. If none of these are available, or the PIC believes weapons security may be compromised, crewmembers may secure their weapons in their quarters, but one crewmember must remain with the weapons at all times. In this case, turn all ammunition over to the PIC.

**7.6. General Hijacking Guidance.** The hijacking of an USAF aircraft could create a serious international incident and jeopardize the safety of passengers and property. An aircraft is most vulnerable when the crew is on board and the aircraft is ready for flight. Hijackers cannot be dealt with as ordinary criminals. Some are mentally disturbed, emotionally unstable individuals for whom the threat of death is not a deterrent, but a stimulus to crime. Delay tactics have been most successful in saving lives and property. Crews must resist all attempts to hijack their aircraft. Resistance may vary from simple discouragement to direct physical attack with weapons. Detection of potential hijackers before they board the aircraft is the best solution to the problem.

7.6.1. Acceptance of Passengers. The host station passenger processing and manifesting facility should conduct anti-hijacking inspections. Do not board passengers unless the PIC is fully satisfied with these inspections. ***EXCEPTION:*** Supporting/supported forces may be anti-hijack inspected at the aircraft by the aircrew.

7.6.2. Aeromedical Procedures. Military medical facility commanders are responsible for the anti-hijacking inspection of patients. When patients are delivered to the aircraft by civilian sources, the aircrew will perform required inspections before departure.

7.6.3. Contingency and exercise movements. During contingencies in support of combat operations involving the movement of large numbers of personnel and exercises, the supported unit should manifest passengers and perform anti-hijacking inspections.

7.6.4. Arms and Ammunition. Passengers will not carry weapons or ammunition on their person or in hand-carried baggage on board an aircraft except special agents and guards of the Secret Service or State Department, and other individuals specifically authorized to carry weapons.

7.6.4.1. Take every precaution to prevent accidental discharge of weapons. If individuals must clear their weapons, ask them to:

7.6.4.1.1. Move to a safe, clear area at least 50 feet from any aircraft, equipment, or personnel before unholstering or unslinging their weapons.

7.6.4.1.2. Clear their weapons in accordance with standard safety procedure.

7.6.4.1.3. Troops and deadhead crewmembers will not retain custody of ammunition on an aircraft but will turn it in to the troop commander or the PIC. Troops may carry unloaded weapons and ammunition on board the aircraft during combat operations.

When the situation dictates, weapons may be loaded at the order of the troop commander or team leader.

7.6.4.2. Carrying Concealed Firearms. The Air Force prohibits all military and contract employees from carrying concealed firearms on duty except when specifically authorized in writing by a firearms-issuing authority and only while performing an official military duty. ***NOTE*****:** Official aircrew orders, specifying the USAF member carry a concealed firearm, satisfy the written authorization requirement. Military members who violate this provision prohibiting the carrying of a concealed weapon without written authorization are subject to administrative or disciplinary proceedings under Article 92, Uniformed Code of Military Justice.

7.6.4.2.1. Except when it might compromise your mission, always carry AF Form 523 while bearing concealed firearms. In those cases, the issuing authority retains the form. The permit number on AF Form 523 includes the heading "CONCEALED." (These procedures help ensure compatibility between US Air Force authorizations to bear concealed firearms and other jurisdictional requirements.)

7.6.4.2.2. MAJCOM authorizes unit commanders to issue AF Forms 523 to personnel when missions require those members to bear a concealed firearm on a regular basis (for example, assigned and gained aircrews armed specifically for anti-hijack purposes).

7.6.4.3. Hollow Point Ammunition. The use of hollow point ammunition is authorized for anti-hijacking purposes except in AORs subject to LOAC or ROE restrictions. In such instances, use ball type ammunition and remove and store hollow point ammunition until required for anti-hijacking purposes.

**7.7. Specific Anti-Hijacking Guidance.** It is imperative that all crewmembers are familiar with the ground and in-flight resistance actions and forced penetration of unfriendly airspace procedures in AFI 13-207, the FIH and current FAA guidance. In the event of a hijacking, crewmembers must act immediately and resourcefully, without instruction, in order to counter the attacker successfully.

**7.8. Aircraft Force Protection Risk Assessment.** Planners and the PIC may use the matrix in **Table 7.1** to help assess the risk to parked aircraft when located at overseas civilian airfields. A cumulative score of less than 55 indicates that normal unmanned aircraft security measures are adequate. A score of 55 to 80 indicates that adequate security is provided by deployed US ground personnel working 24 hour operations. If the cumulative score is greater than 80, or if any of the shaded areas in the figure are applicable, commanders should consider deploying or contracting security personnel. During unscheduled or emergency landings, the PIC should contact the US Embassy or USDAO for security assistance.

**Table 7.1. Aircraft Force Protection Risk Assessment Matrix.**

| Factors | 0 Points | 5 Points | 10 Points | 15 Points |
|---|---|---|---|---|
| Local terrorist threat is currently [1] | Negligible | Low | Medium [3] | High [3] |
| Installation/airport security services are[2]: | Provided by host military forces only | Provided by host military and contract security forces | Contract security forces only | Not available [3] |
| Host security forces control entry: | To the flightline and installation/ airport | To the flightline only | To the installation/ airport only | To neither the flightline nor the installation/ airport [3] |
| There is perimeter fencing or barriers around: | The flightline and installation/ airport | The flightline only | The installation/ airport only | Neither the flightline or the installation/ airport [3] |
| Host security forces will provide ______ to guard the aircraft | An armed sentry | An unarmed sentry | Random security patrol coverage only | No sentry or random patrol coverage [3] |
| Host security forces will ______ security incidents involving the aircraft | Provide armed response to | Provide unarmed response to | Notify civilian authorities of | Notify PIC of [3] |
| The aircraft will be parked: | | Separate from host military and civilian aircraft | Among other host military aircraft only | Among civilian aircraft |
| The aircraft will _____illuminated during the hours of darkness [2] | | Be adequately | Be marginally | Not be [3] |
| Total Points: | | | | |

**Notes:**
1. Derive the local threat from valid intelligence sources only.
2. "Adequate lighting" is equal to the illumination provided by one standard USAF light cart.
3. If a security response team and security patrol is not present, commanders should consider deploying or contracting security personnel.

# Chapter 8

## OPERATIONAL REPORTS AND FORMS

**8.1. General.** This chapter contains a description of applicable reports and forms. For assistance in completing safety forms contact the wing/group, unit, or local flight safety officer.

**8.2. AF IMT Form 457, USAF Hazard Report.** Refer to AFI 91-202, *The USAF Mishap Prevention Program*. The USAF hazard reporting system provides a means for Air Force personnel to alert supervisors and commanders to hazardous conditions requiring prompt corrective action. A hazard is any condition, act, or circumstance that jeopardizes or may jeopardize the health and well-being of personnel, or which may result in loss, damage, or destruction of any weapons system, equipment, facility, or material resource.

**8.3. AF IMT Form 651, Hazardous Air Traffic Report.** Refer to AFI 91-202.

8.3.1. The Air Force HATR program provides a means for personnel to report all near midair collisions and alleged hazardous air traffic conditions. Use information in HATR reports only for mishap prevention. See AFI 91-202 for a list of reportable incidents.

8.3.2. Procedures:

8.3.2.1. Make an airborne report of the hazardous condition to the nearest ATC agency (e.g. center, FSS, control tower, or aeronautical radio station), and give the following information as appropriate:

8.3.2.1.1. Identification or call sign.

8.3.2.1.2. Time and place (radial/DME, position relative to the airfield, etc.).

8.3.2.1.3. Altitude or flight level.

8.3.2.1.4. Description of the other aircraft or vehicle.

8.3.2.1.5. Include a verbal statement as soon as possible after occurrence that a written HATR report will be filed upon landing. ***NOTE:*** ATC agencies (e.g., FAA, etc) must know if an official report is being filed.

8.3.2.2. File the HATR as soon as possible (within 24 hours) using any available means of communication. Normally, it should be filed at the base operations office at the landing airport. If this is impractical and if communications permit, notify the safety office of the Air Force base where the condition occurred, the safety office at the home station, or as prescribed by the overseas MAJCOM. In any case, provide the safety office with all available information needed to prepare AF IMT Form 651. Turn in a completed copy of AF Form 651 to the wing/group safety office. ***NOTE:*** HATR reports are not privileged information and may be released outside the USAF.

8.3.3. Individuals submitting a HATR are granted immunity from disciplinary action provided:

8.3.4. Their violation was not deliberate.

8.3.4.1. They committed no criminal offense.

8.3.4.2. No mishap occurred.

8.3.4.3. They properly reported the incident using the above procedures.

**8.4. AF Form 711B, USAF Aircraft Mishap Report.** Refer to AFMAN 91-223, Aviation *Safety Investigations and Reports.*

8.4.1. Responsibilities. Notify the appropriate authorities of any mishap involving aircraft or crew. When notified, units will initiate investigative and reporting actions in accordance with AFI 91-204. ***NOTE:*** Do not attempt to classify a mishap.

8.4.2. Reportable Mishaps:

8.4.2.1. Report damage to the aircraft, or injury to the crew or passengers; as well as any damage or injury to another organization's equipment or personnel resulting from the movements or actions of an aircraft or crew.

8.4.2.2. Report the following occurrences (T-1):

8.4.2.2.1. A physiological episode. A physiological episode is a physiological reaction, near accident, or hazard in-flight due to medical or physiological reasons. This includes: ***NOTE*:** In the event of a physiological episode, all crewmembers and passengers involved will report to a flight surgeon as soon as practical.

8.4.2.2.1.1. Proven or suspected case of hypoxia.

8.4.2.2.1.2. Decompression sickness due to evolved gas (bends, chokes, neurocirculatory collapse), or severe reaction to trapped gas resulting in incapacitation.

8.4.2.2.1.3. Hyperventilation.

8.4.2.2.1.4. Spatial disorientation or distraction resulting in an unusual attitude.

8.4.2.2.1.5. Loss of consciousness from any cause.

8.4.2.2.1.6. Death by natural causes of any crewmember in flight.

8.4.2.2.1.7. Unintentional loss of pressurization if cabin altitude is above FL170, regardless of effects on personnel.

8.4.2.2.1.8. Alcohol intoxication and hangover (crew only).

8.4.2.2.1.9. Illness (both acute and pre-existing), including food poisoning, dehydration, myocardial infarction, seizure, and so forth.

8.4.2.2.1.10. Exposure to toxic, noxious, or irritating materials such as smoke, fumes, or liquids.

8.4.2.2.2. In-flight flameout, engine failure, required engine shutdown, suspected engine power loss, or loss of thrust sufficient to preclude maintaining level flight above MEA. ***NOTE*:** Intentional shutdowns for training and FCF are excluded; however, report failure to restart, using the criteria above.

8.4.2.2.3. Uncommanded propeller reversal.

8.4.2.2.4. Flight control malfunction resulting in an unexpected or hazardous change of flight attitude, altitude, or heading.

8.4.2.2.5. Malfunction of landing gear when difficulty is experienced using emergency system or procedures.

8.4.2.2.6. In-flight loss of all pitot-static instrument indications or all gyro stabilized attitude or directional indications.

8.4.2.2.7. Spillage or leakage of radioactive, toxic, corrosive, or flammable material from aircraft stores or cargo.

8.4.2.2.8. All cases of departure from intended takeoff or landing surface onto adjacent surfaces.

8.4.2.2.9. Any incident which does not meet the established criteria for a reportable mishap but, in the judgment of the PIC, needs to be emphasized in the interest of flight safety.

**8.5. Reports of Violations/Unusual Events or Circumstances.** Violations identified in AFI 11-202V3 and navigation errors (including over-water position errors exceeding 24NMs, border and ATC violations) will be reported (T-1).

8.5.1. Include the following: factual circumstances, investigation and analysis, findings and conclusions, recommendations, and actions taken.

8.5.1.1. Attachments should include; notification of incident, Crew orders, statement of crewmembers (if applicable), and documenting evidence (logs, charts, etc.).

8.5.2. In addition to the information listed, the historical flight plan will be downloaded onto a floppy disk or flash drive and turned in to the C2 center or owning standardization and evaluation office.

8.5.3. Send the original investigation report within 45 days to HQ ACC/IG (T-2). AFRC units receiving alleged violations will send the original investigation through channels to arrive at HQ AFRC/IGI within 35 days (T-2). HQ AFRC/IGI will send the investigation report to HQ ACC/IG within 45 days (T-2).

8.5.4. The following OPREP-3, *Event or Incident Report* reporting procedures for all aircraft notified of navigational errors exceeding 24 NMs will be reported under AFI 10-206, *Operational Reporting*:

8.5.4.1. On notification of a navigational position error, the PIC (or agency receiving notification) will document the circumstances surrounding the incident (report content below) and ensures submission of an OPREP-3 report through C2 channels.

8.5.4.2. Include the following:

8.5.4.2.1. Name and location of unit submitting report, mission identification number, reference to related OPREPs-3, type of event (e.g., state "navigation position error."), date, time (Zulu), and location (e.g., ARTCC area).

8.5.4.2.2. Description of facts and circumstances. Include aircraft type and tail number, unit (wing/group or squadron assignment of crew), home base, route of flight, point of alleged deviation, and miles off course.

8.5.4.2.3. The PIC must keep the appropriate agencies apprised of any unusual events or circumstances impacting their missions. Examples of reportable events include meaconing, jamming, intrusion, interception, fuel dumping, loss of multiple engines, hostile fire, injury to passengers or crewmembers, etc. This list is not exhaustive. Some events may require the C2 agency to forward OPREP reports to higher headquarters. The old adage, "when in doubt, report it," applies.

**8.6. AF IMT Form 853, Air Force Bird Strike Report.** Refer to AFMAN 91-223, Aviation *Safety Investigations and Reports.*

# Chapter 9

## TRAINING POLICY

**9.1. General.** This chapter outlines requirements and restrictions for training and evaluation missions. Refer to AFI 11-202V1, *Aircrew Training*, AFI 11-202V2, *Aircrew Standardization/Evaluation*, AFI 11-2HC-130V1 and AFI 11-2HC-130V2 for additional information.

**9.2. Passengers and MEP on Training Missions.** Refer to **Chapter 6**.

**9.3. Training Aircraft Not Capable of Flight (Not applicable to ARC).** If an aircraft is not capable of departure within four hours after scheduled departure time, the mission may be canceled at the discretion of the PIC. Provide a planned minimum of 2 hours for aircraft preflight duties before the end of the 4-hours.

**9.4. Knock-It-Off (KIO) and Terminate Calls.** Use KIO or Terminate procedures to direct aircraft to stop engagements, scenarios and tactical maneuvering. Procedures IAW AFI 11-214, *Air Operations Rules and Procedures*.

**9.5. Instructor/Flight Examiner Briefing. (T-1)** Before all training/evaluation missions, aircraft commanders or instructors/flight examiners will brief their crew on the following additional items:

9.5.1. Training/Evaluation requirements. Instructors/evaluators (for each crew position) will outline requirements and objectives for each student or examinee.

9.5.2. Planned profile and seat changes.

**9.6. Debriefing. (T-1)** For all training flights, instructors will:

9.6.1. Review and critique student performance.

9.6.2. Review training requirements fulfilled for each student and aircrew member.

9.6.3. Answer technical questions.

9.6.4. Preview the objectives of the next mission.

9.6.5. Complete required training documentation.

**9.7. Touch-and-go Landings. (T-1)** Touch-and-go landings are authorized only on designated training, evaluation, or currency missions.

9.7.1. Flight Idle Touch-and-go landings may be performed by:

9.7.1.1. Instructor pilots, instructor pilot candidates on initial or requalification instructor evaluations, or flight examiner pilots from either pilot seat.

9.7.1.2. Any pilot from either seat provided an instructor pilot, instructor pilot candidate on initial or requalification instructor evaluation, or flight examiner pilot is in the other seat.

9.7.1.3. PIC qualified pilots and MPD pilots may land from either seat if the PIC is touch-and-go certified and is touch-and-go designated on the flight orders.

9.7.1.4. Copilot qualified pilots may land from the right seat if the PIC is touch-and-go certified and is touch-and-go designated on the flight orders.

9.7.1.5. An instructor pilot, instructor pilot candidate on initial or requalification instructor evaluation, or flight examiner pilot will be in either pilot seat for ground idle touch-and-go landings. ***NOTE:*** Aircraft Commanders must have a minimum of 100 hours in command of C-130 type aircraft prior to certification. Documentation of touch and go certification will be IAW 11-2HC-130V1.

9.7.2. Touch-and-go restrictions.

9.7.2.1. Comply with all flight manual restrictions and procedures to include performance, fuel and cargo limits.

9.7.2.2. Minimum runway length is:

9.7.2.2.1. 7,000 feet for NVG touch-and-go landings.

9.7.2.2.2. 5,000 feet for 50 percent flight idle touch-and-go landings.

9.7.2.2.3. 6,000 feet for all other touch-and-go landings.

9.7.2.3. Minimum ceiling/visibility: 300 feet and RVR 4000 (3/4 SM visibility)

9.7.2.4. Only authorized when crosswind component corrected for RCR is within the recommended zone for the landing crosswind chart.

9.7.2.5. Do not accomplish touch-and-go landings on slush covered runways.

9.7.2.6. Authorized when normal wake turbulence criteria are met.

9.7.2.7. Do not perform ground-idle touch-and-go landings in conjunction with no-flap or NVG landings.

9.7.3. Include type of touch-and-go as part of the briefing, (i.e., ground-idle or flight idle).

**9.8. Stop-and-Go Landings. (T-1)** Stop-and-go landings are authorized only on designated training, evaluation, or currency missions.

9.8.1. Stop-and-go landings may be performed by any C-130 qualified pilot.

9.8.2. Stop-and-go restrictions:

9.8.2.1. Runway remaining must be long enough to allow refusal speed to be greater than or equal to takeoff speed used. Flight engineers will compute stop-and-go distance IAW **paragraph 12.8.6**

9.8.2.2. Crosswind component corrected for RCR must be in the recommended zone of the landing crosswind chart.

9.8.2.3. Ceiling and visibility must be at least 300 feet and ¾ mile (RVR 4000).

9.8.2.4. Not authorized in conjunction with no-flap landings.

9.8.2.5. Must meet normal wake turbulence criterion.

9.8.2.6. Not authorized when normal wake turbulence criteria are not met or when intercepting or crossing the flight path of a wide-bodied aircraft while performing any approach or landing.

**9.9. Low/Missed Approaches. (T-1)** Initiate a planned missed approach no lower than:

9.9.1. Decision Height for precision approaches

9.9.2. MDA for non-precision approach

9.9.3. No minimum for Visual approach/VFR go-arounds

9.9.4. 200 feet AGL for visual approach/VFR go-around during simulated emergency

9.9.5. 500 feet AGL for restricted low approach (aircraft, equipment, or personnel on the runway).

**9.10. Simulated Instrument Flight. (T-1)** Artificial vision restricting devices are not authorized for any phase of flight. Simulated instrument flight may be flown and logged without the use of a vision-restricting device.

**9.11. Night Vision Goggle Training. (T-1).** Crews will accomplish training and qualification according to AFI 11-2HC-130V1, AFI 11-2HC-130V2, and formal training syllabi before performing NVG operations.

**9.12. Maximum Effort Takeoff. (T-1)** Maximum effort takeoffs should be performed from the main runway when it is available (i.e., safe and practical to taxi from an assault landing zone). Takeoffs from the assault zone when a main runway is available are authorized during formal mission qualification training or when approved by the OG/CC for currency or proficiency. ***WARNING:*** Max effort operations at high altitude, gross weight, and temperatures are critical; climb angles as low as 2.5 degrees may prevent the aircraft from accelerating. Any further climb angle increase may result in the loss of airspeed and the onset of a pre-stall buffet.

**9.13. Simulator Only Maneuvers. (T-1)** The following maneuvers will not be practiced or demonstrated in the aircraft:

9.13.1. Full stalls.

9.13.2. Rudder force reversals.

9.13.3. Spins.

9.13.4. Runaway trim malfunctions.

9.13.5. Hydraulic system loss by turning engine driven hydraulic pumps off.

9.13.6. Two-engine approaches, landings and missed approaches.

**9.14. Instrument Steep Turns: (T-1)** Authorized during daylight VMC with up to 60-degrees bank. Turns are restricted to 5,000 feet above the ground or cloud deck for bank angles in excess of 45 degrees. Review stall speeds prior to performing turns.

**9.15. Slow Flight: (T-1)** Requires direct IP supervision and is only authorized at or above 5,000 feet AGL. Fly at approach, threshold, and 1.2 power off stall speed with gear down and flaps 0%, 50%, or 100%. Do not exceed 15-degrees of bank. PJ MOS and Air Refueling MOS may be demonstrated. If PJ MOS is demonstrated do not exceed 30 degrees angle of bank. If Air Refueling MOS is demonstrated, do not use any angle of bank.

**9.16. Simulated Emergency Flight Procedures.** Simulated emergency flight procedures will be conducted IAW AFI 11-202V3 and this instruction (T-1).

9.16.1. If an actual emergency arises, terminate all simulated emergency flight procedures training and flight maneuvers practice.

9.16.2. Practice emergencies (which require simulating an engine shutdown, placing switches in other than their normal position, or an abnormal configuration) only during training, evaluation, or currency flights when an instructor or flight examiner pilot is in one of the pilot seats. Instructor pilot candidates who occupy a pilot seat and are under the supervision of a flight examiner pilot, not in a pilot seat, may conduct simulated emergency procedures during initial or requalification upgrade evaluations. This applies to all maneuvers defined in **paragraph 9.22** unless otherwise specified in the individual maneuver restrictions.

9.16.3. Legacy trained copilots may conduct simulated 3-engine approaches, missed approaches, and landings with squadron commander approval and when under the direct supervision of an IP. ***NOTE*:** Unless otherwise specified in a MAJCOM supplement to AFI 11-202V2, place a letter of certification by the SQ/CC in the FEF and make an entry on the AF IMT form 1381/4348. Documentation of designation as an PIC candidate will be IAW AFI 11-2HC-130V1.

9.16.4. MPD pilots may conduct 3-engine approaches, missed approaches, landings and no-flap approaches and landings from the left seat under the direct supervision of an IP. Do not compound engine out training with any other simulated emergencies for MPD pilots.

**9.17. Simulated Engine Failure and 3-Engine Approaches/Landings/Missed Approaches. (T-1)** Direct IP supervision required except for IP candidates under the supervision of a flight examiner during initial or requalification upgrade evaluations to instructor pilot. One throttle may be retarded to 500-1000 in-lbs at not less than $V_{MCA}$ (one engine inoperative, out of ground effect) and not less than 300 feet AGL. Simulated engine failure is authorized in daylight IMC if the weather is at or above circling minimums and at night with weather at or above 1,000 foot ceiling and 2 SM visibility or circling minimums, whichever is higher. For landings, crosswind component must be within the recommended zone of the landing crosswind chart. Use all 4 engines for a touch-and-go takeoff.

9.17.1. Normally turns should be planned to be in the direction of the good engines. Turns into simulated failed engines should be minimized. Turns into simulated failed engines are permissible but require a higher degree of pilot skill than with actual failed engines and must be smooth and coordinated.

9.17.2. When conducting simulated engine(s) out training, the flight engineer will post actual charted minimum control speeds on the TOLD card. For charted one-engine out minimum control speed above 109 knots, calculate a new minimum control speed by adding 8 knots during simulated one-engine out training. For a charted 2-engine out minimum control speed that falls between 117 and 128, calculate a new minimum control speed by adding 8 knots during simulated 2-engine out training. During simulated 3-engine takeoff operations, takeoff speed will be adjusted for minimum control speed. If the charted minimum control speed is above 109 knots, add the 8 knot correction factor.

9.17.3. Additional Restrictions:

9.17.3.1. Simulated engine-out no-flap landings are restricted to PIC candidates and above.

9.17.3.2. Planned go-around from simulated engine-out no-flap approaches are not authorized.

9.17.3.3. Required go-around from simulated engine out no-flap approaches require setting the flaps to 50% and using all four engines.

9.17.3.4. Do not compound engine out circling approaches with any other simulated malfunctions.

9.17.3.5. Missed approach/go-arounds will be executed IAW **paragraph 9.9** of this instruction.

**9.18. Simulated Engine-Out Takeoff. (T-1)** Requires direct IP supervision and authorized during daylight VMC only. Maximum aircraft gross weight is limited to 120,000 pounds. Crosswind component must be within the recommended zone of the takeoff crosswind chart. Runway must be dry, hard surfaced, and at least 147 feet wide, by 7,000 feet long.

**9.19. Actual Engine Shutdown and Airstart. (T-1)** Direct IP supervision required. One engine may by shutdown at no lower than 2,500 feet AGL in daylight VMC.

**9.20. No-Flap Approach/Landing. (T-1)** Direct IP supervision required. Maximum aircraft gross weight limited to 120,000 pounds. Crosswind component must be within the recommended zone on the crosswind chart. Authorized in daylight IMC if the weather is at or above circling minimums and at night with weather at or above 1000 foot ceiling and 2 SM visibility or circling minimums whichever is higher. Use 50% flaps for a go-around and touch-and-go takeoff.

9.20.1. Additional Restrictions:

9.20.1.1. Legacy trained copilots may perform no-flap approaches or landings with squadron commander approval and when under the direct supervision of an IP.

9.20.1.2. Engine out no-flap approaches are restricted to PIC candidates and above.

9.20.1.3. Do not compound no-flap circling approaches with any other simulated malfunction.

**9.21. Windmill Taxi Start. (T-1)** Requires direct IP supervision and authorized only during daylight. Crosswind component must be within the recommended zone of the flight manual takeoff crosswind chart. Runway must be dry, hard-surfaced, and at least 147 feet wide. ***NOTE:*** Flight manual recommendations are mandatory.

**9.22. Formal Course Maneuvers Only. (T-1)** The following maneuvers are authorized only during formal course upgrade/qualification training.

9.22.1. Approach to Stalls: Direct IP supervision required. Authorized during formal upgrade training in day VMC at a minimum of 10,000 ft above the ground or 5,000 ft above the cloud deck, whichever is higher.

9.22.2. Aborted Normal Takeoff. Requires OG/CC approval and direct IP supervision and authorized during formal upgrade training in daylight VMC only. Runway must be dry, hard-surfaced, and long enough to allow refusal and takeoff speeds to be equal. Crosswind component must be within the recommended zone of the takeoff crosswind chart. Initiate the abort by stating "REJECT" before refusal speed. Do not practice aborts from touch-and-go landings. Do not shut down an engine due to simulated malfunctions.

9.22.3. Aborted Maximum Effort Takeoff. Requires OG/CC approval and direct IP supervision and authorized for PIC upgrades and above during formal upgrade training. Procedure is restricted to the main runway during daylight VMC. Runway must be dry, hard surfaced, 147 feet wide and long enough to allow refusal and takeoff speeds to be equal. Crosswind component must be within the recommend zone of the takeoff crosswind chart. Simulate a runway length less than CFL. Initiate the abort by stating "REJECT" at or below a refusal speed based on simulated runway length. Compare the distance traveled to runway length and point out the ramifications of operating with less than critical field length. Do not shut down an engine due to simulated malfunctions. Do not practice aborted max effort takeoffs from stop-and-go landings.

9.22.4. Unusual Attitudes and Spatial Disorientation. Authorized at not lower than 10,000 feet AGL.

# Chapter 10

## LOCAL OPERATING PROCEDURES

**10.1. General.** Units local and/or unique unit operation procedures may be published in this chapter. Commence by supplementing this paragraph with general and applicability information with regards to the specific unit.

# Chapter 11

## NAVIGATOR PROCEDURES

**11.1. General.** This chapter contains guidance on navigator specialized duties and navigation procedures and forms. Publish local procedures in the unit supplement to this AFI. General instructions for completion of AF Form 4116, **C-130 Navigator Flight Plan and Log,** are provided in this chapter. If information in this chapter conflicts with AFTTP 3-3.HC-130, this instruction takes precedence.

**11.2. Navigator Specialized Duties.** Rescue HC-130 and CSAR MC-130P aircraft will be manned with a single navigator who can perform all navigational duties:

11.2.1. Advise the crew upon crossing the combat entry point (CEP) and ensure the aircraft is prepared for combat. If applicable, advise crew upon crossing the forward edge of the battle area (FEBA), forward line of troops (FLOT), passive detection line (PDL), etc.

11.2.2. Brief anticipated threats and aircraft deviations prior to a threat leg. Provide course heading and minimum safe altitude (MSA) briefing, if required.

11.2.3. Monitor RWR equipment and advise of the threat situation. Accomplish threat detection, avoidance, and reaction, as necessary.

11.2.4. Notify and/or warn the crew if threats are encountered. Update crew on status of threats and planned maneuvers.

11.2.5. Direct defensive maneuvers, employ electronic countermeasures (ECM), infrared countermeasures (IRCM), and dispense chaff and flares, as appropriate. Brief ECM/IRCM effectiveness when it can be determined.

11.2.6. Advise the pilots when clear of threats and able to resume planned heading, altitude, and airspeed.

11.2.7. Advise the crew upon crossing the combat exit point.

11.2.8. Direct NVG low-level navigation to include start climb points and NVG altitudes.

11.2.9. Ensures terrain clearance using the Radar, IDS, or visually as required.

11.2.10. Monitor navigation and maintain awareness of position relative to threats and terrain. Be prepared to supply the pilot with the highest altitude available, based on the threat, for each leg of the planned route. Navigator will brief headings, airspeeds, and altitudes. Responsible for SCNS programming and updating, time control, mission planning, and monitoring of fuel status (fuel should be checked at least once every 60 minutes). Ensure all navigation duties are clearly understood prior to flight. Compute a CARP/HARP as required.

11.2.11. Monitor the electromagnetic environment and provide warning to the pilot of possible conflicting traffic with type and clock position.

11.2.12. Additional duties as directed by the PIC.

**11.3. General Flight Planning Procedures. (T-1)** See **paragraph 6.16** Navigator changes (engine running offload or augmented crews) will include, as a minimum, a briefing on equipment status and any changes to the original flight planned routing.

11.3.1. Flight Plans. Forms printed from either a MAJCOM-certified automated flight planning system or current AF Forms are authorized. Automated flight planning system forms will mirror current AF Forms as published on the Air Force e-Publishing web site. Computed data will match aircraft type, configuration, requirements and limitations for mission to be flown.

11.3.2. Signature. Sign all fuel and flight plans that are used for planned missions. The navigator's signature will signify all data was checked for accuracy. On the AF IMT Forms 4116, sign in the indicated block on page 2 to certify accuracy of all entries. Any entries not required for a particular mission on the AF Form 4116 may be left blank.

11.3.3. Data transfer. If the flight-planning computer transfers a flight plan to the aircraft electronically, it will be a MAJCOM-approved system.

11.3.4. A MAJCOM-certified flight plan and log (AF Form 70, AF Form 4116, or computer generated equivalent) is required for all flights except local area training flights with an established standard procedure.

11.3.5. A fuel plan is required for all flights except local area training flights with established standard ramp fuel loads.

11.3.6. Automated Flight Planning System**.** The aircrew is responsible for ensuring the accuracy of automated flight planning data generated for use. This entails aircrew paying special attention to entering arguments such as aircraft configuration, fuel load, engine performance, fuel flow model (climb, cruise, and descent), heading/magnetic variation calculation, temperature, winds, plus any other variables which affect the accuracy of the calculated flight and fuel plan.

11.3.6.1. Creating Flight Logs. In addition to manual flight logs (AF Form 4116), MAJCOM-certified automated flight planning system software is authorized to create a navigator flight log.

11.3.6.2. Automated Flight Planning Software. Uncertified, untested or beta versions of automated flight planning system software will not be used for actual mission planning. HQ ACC will publish a listing of certified automated flight planning system software with release notification via headquarters message.

**11.4. AF Form 4116. (T-1)** The AF Form 4116 was developed to provide a tool for all possible missions of the C-130 and variants. Entries on the AF IMT Form 4116 are either self-explanatory or explained below. See **Figure 11.2** for example of completed AF Form 4116.

11.4.1. CRUISE CEILING - This altitude is obtained from either the automated flight planning system flight performance model (FPM), the appropriate aircraft performance manual and without regard to ATC requirements for direction of flight. Ensure use of 100% or 95% engine performance and appropriate turbine inlet temperature (TIT) setting based on current operating procedures and appropriate technical order performance data recommendations. When passengers are carried and oxygen is not available to them, the HIGHEST ACC FL will not exceed FL 250. Enter the flight level to the nearest 100 feet.

11.4.2. DRAG INDEX - This value is obtained from the appropriate aircraft performance manual.

11.4.3. ENDURANCE - Compute preflight endurance using the Average Cruise Fuel Flow. Flying time based on fuel available at takeoff. To compute take Item 11 minus Item 9 minus 2900 lbs unusable fuel (or as indicated from aircraft technical order/Section V, Primary Fuel Management).

11.4.4. When an alternate destination is required, ensure at least a single separate waypoint be included in the flight plan to include name of the alternate, altitude, time, course, distance, and winds. If additional IFR enroute waypoints are available, inclusion of these will enhance fuel planning accuracy.

**11.5. Flight Charts (Oceanic/Category I Route Structure and IFR/Category II Routing). (T-1)** Hardcopy charts will be available for use during high level flight operations. On Category II routes when under ATC control, the use of DoD approved FLIP publications meets this requirement. Appropriate scale electronic charts on a portable moving map system may be used as the primary aeronautical chart reference; however, hardcopy charts will be immediately available in case of loss of portable laptop. ***NOTE:*** Category I and II Route definitions are found in **Attachment 1**.

11.5.1. Chart Scale. As a minimum, ensure 1:500,000 or larger scale hardcopy charts (i.e., TPC, LFC, JOG) are available during departure/arrival procedures (either IFR or VFR). When utilizing either hardcopy or moving map display during departure/arrival phases of flight (as a minimum) ensure Airports, Airspace Boundaries, SUAS Boundaries, VVOD (if available), and ECHUM are displayed. Hardcopy charts for in-flight use during oceanic/Category I operations will be either JNC or GNC series. ***NOTE:*** JNCA charts (1:3,000,000) may be used; however they are only available from NGA as hardcopy products].

11.5.2. Show the following items on the printed chart:

11.5.2.1. Navigator's name, date constructed, chart number, and chart edition. Charts printed from an automated planning system will also include DAFIF and CADRG currency. Departure and arrival charts will be chummed.

11.5.2.2. Flight plan course line, reporting points, waypoint identifier (to correspond with flight plan), and ETP location. Flight plan doghouses may be displayed with magnetic course and distance.

11.5.2.3. Annotate suitable emergency airfields. Consider the following factors when selecting emergency airfields: weather conditions, runway width/length, runway weight-bearing capacity, runway lighting, radio navigational aids (availability/monitored), and proximity to planned flight path.

11.5.2.4. Display appropriate airspace boundaries (e.g., ADIZ, ARTCC, BZ, FIR, UIR), Special Use Airspace (SUAS) boundaries, and TFRs pertinent to the route.

11.5.2.5. If available, display VVOD data on departure/arrival charts. As a minimum, under normal circumstances the filter height should be set no higher than 100 feet. ***NOTE:*** When utilizing charts printed from automated flight planning systems, ensure selection of Lambert Conformal Conic map projection when plotting great circle routes. Not all selectable projections provide an approximation of great circle routing when measuring courses between points on the chart.

**11.6. Use of Laptop Computers during Flight.** Certified laptop computers with automated flight planning software are approved for in-flight use IAW AFI 11-202V3. Portable automated flight planning systems, to include moving map capability, are intended to enhance aircrew situational awareness. Consequently, independent GPS-fed laptop computers, which do not fall under the category of CNS/ATM avionic systems, will not be considered RNAV equipment for IFR en route or terminal navigation, regardless if the required navigation performance (RNP) value of that airspace can be maintained. Additionally, ACC has not provided operational approval for GPS navigation equipment as a primary means of navigation in remote/oceanic (Category I) areas.

**11.7. Fuel Planning. (T-1)** Accomplish fuel planning in accordance with the certified automated flight planning software or applicable MDS performance manual (T.O. 1C-130H-1-1). Aircrew will accomplish fuel planning on the AF Form 4116 or certified automated flight planning forms which replicate the AF Form 4116. All other items of the fuel analysis portion of AF Form 4116 are explained in **Table 11.1** ***NOTE*:** For tactical mission fuel planning, calculations derived from automated flight planning systems will be considered as the primary method and, by exception, 6,000 lbs/hr used in the absence of this capability.

**Table 11.1. Air Force Form 4116 Fuel Load Components.**

<table>
<tr><td colspan="2">ENROUTE. Fuel for flight time from departure to overhead destination or initial penetration fix at cruise altitude (including time for planned orbit, escort, search, recovery, appropriate climb, weather recon, etc. when applicable).</td><td rowspan="5">FLIGHT PLANNED LOAD</td><td rowspan="5">REQUIRED RAMP</td></tr>
<tr><td colspan="2">RESERVE. 10% of flight time over a Category I route/segment not to exceed 45 Minutes at normal cruise. For orbit/search missions, 10% of flight time for that portion with inadequate NAVAIDS from the orbit/search point to a Category II route segment. Compute at terminal fuel flow.</td></tr>
<tr><td>ALTERNATE AND MISSED APPROACH<br><br>Alternate: Fuel for flight time from overhead destination or initial penetration fix to alternate, or most distant alternate when two are required. Compute at terminal fuel flow. Add 10% reserve when time to alternate exceeds 1+30. Required whenever alternate must be filed.<br><br>Missed Approach: 2,200 lbs. Required if destination is below ceiling minimums but above visibility minimums for planned destination approach.</td><td rowspan="3">REQ OVR DEST</td></tr>
<tr><td>HOLDING. Used If flight time over a Category II route is greater than 3+20, when an alternate is located in Alaska, when an alternate is not available or located at latitudes greater than 59 degrees N/S. Use 3,500 lbs.</td></tr>
<tr><td>APPROACH AND LANDING<br><br>Approach: 1,000 lbs. Entry always required.<br><br>Minimum Landing Fuel: 6,000 lbs. Entry always required.</td></tr>
</table>

| | | | |
|---|---|---|---|
| IDENTIFIED EXTRA | PRESSURIZATION LOSS. Additional fuel for pressure loss at ETP - used when pressurized, carrying passengers, and aircraft oxygen is not available to the passengers. **Compute at 1,000 lbs/hr for time from ETP to FSAF or LSAF or "T" time.** If computed fuel required for pressurization loss is less than total of items 2, 4, 5, and 12, no additional entry required in item 7. If computed fuel exceeds the total of item 2, 4, 5, and 12, add the difference in item 7. | | |
| | STORED FUEL. Ramp fuel for succeeding legs without refueling. | | |
| | OFF-COURSE MANEUVERS. Fuel for anticipated off-course maneuvering for terrain clearance, thunderstorm avoidance, and ATC requirement. **Compute at 100 lbs/min for departure, 50 lbs/min en route.** | | |
| | ICING. **500 lbs/hour** of anticipated icing. | | |
| | KNOWN HOLDING DELAYS. Fuel for anticipated/planned excess holding time. **Compute at terminal fuel flow.** | | |
| | INSUFFICIENT OR UNRELIABLE NAVAIDS. **1,000 pounds maximum.** Add for insufficient or unreliable NAVAIDS at destination. | | |
| | HELICOPTER OFFLOAD. Fuel planned for air refueling offload. | | |
| **TAXI AND RUNUP** | **Normally 1,300 lbs.** For known taxi delays or engine-running ground time in excess of 20 minutes, add 50 lbs/min. | | |
| **UNIDENTIFIED EXTRA** | Difference between required ramp and actual ramp fuel. Normally, **should not exceed 2200 lbs** for fuel conservation purposes. | | |
| **MINIMUM DIVERSION / REQUIRED OVER DESTINATION** | Total of ALTERNATE and MISSED APPROACH, HOLDING, and APPROACH/LANDING. **Never less than 7,000 lbs.** | | |

11.7.1. Fuel Planning with Automated Flight Planning Systems. When using automated flight planning tools, all required fuel, performance, and ETP calculations may be used in lieu of manually derived calculations from performance technical orders. Add alternate, identified extra, and reserve fuel in addition to the calculations derived from automated flight planning systems.

11.7.1.1. When utilizing the automated flight planning flight performance model, normally use 970$^{o}$ TIT and 95% engine performance to calculate cruise altitude ceiling, unless directed otherwise by appropriate instructions and technical orders.

11.7.1.2. When fuel analysis is accomplished using automated flight planning tools, use the fuel flow from the last applicable enroute leg of the computer flight plan to determine the terminal fuel flow value.

**11.8. T. O. 1C-130H-1-1 Fuel Planning. (T-1)** All times are calculated in minutes and all data is computed using 95% engine performance. Use the Enroute Fuel Computation Worksheet on the AF Form 4116, page 2/3. ***NOTE*:** When computing fuel using T.O. 1C-130H-1-1, use the appropriate drag index. Standardized drag indexes may be established by local OGVs and published in local supplements. Before takeoff, confirm the drag index used with the flight engineer to account for any changes to aircraft configuration (e.g., FLIR turret removed).

11.8.1. There are three distinct phases of flight for which required fuel quantities and or fuel flows must be calculated. These three phases are: Initial climb out, start cruise and end cruise. Procedures for the necessary calculations are as follows:

11.8.1.1. Prior to any calculations, use the appropriate TO 1C-130H-1-1, Part 4 Figures to extract Time to Climb (TTC), Distance to Climb (DTC), and Fuel to Climb (FTC). Apply the correct temperature deviation and correct for pressure altitude to compute all climb data.

11.8.1.2. Using TTC and DTC, calculate climb TAS.

11.8.2. Initial Climb-Out Fuel. In the climb section of the enroute fuel computation worksheet enter takeoff gross weight (TOGW), TTC, and FTC in the appropriate blocks.

11.8.3. Start Cruise.

11.8.3.1. Subtract climb fuel from the TOGW to obtain the start cruise gross weight.

11.8.3.2. Enter the total flight time from the flight plan in the total time block. Subtract TTC from the total time to obtain cruise zone time.

11.8.3.3. Enter the appropriate TO 1C-130H-1-1 Part 5 figure to extract fuel flow. Entering arguments are start cruise gross weight, pressure altitude and temperature deviation. Fuel flow extracted is per engine. Multiply the extracted fuel flow by four to arrive at fuel flow total.

11.8.3.4. Divide the fuel flow total by 60 and multiply by the zone time in minutes to obtain start cruise zone fuel.

11.8.4. End Cruise.

11.8.4.1. Subtract cruise zone fuel from the start cruise gross weight to obtain end cruise gross weight.

11.8.4.2. Enter the appropriate TO 1C-130H-1-1 Part 5 figure to extract fuel flow. Entering arguments are end cruise gross weight, pressure altitude and temperature deviation. Fuel flow extracted is per engine. Multiply the extracted fuel flow by four to arrive at fuel flow total. This is also the terminal fuel flow.

11.8.5. Average Cruise Fuel Flow.

11.8.5.1. Average the start cruise and end cruise fuel flow to obtain the average cruise fuel flow.

11.8.5.2. Divide the fuel flow total by 60 and multiply by the cruise zone time to obtain cruise zone fuel total.

11.8.6. Total enroute fuel. Add the FTC to the cruise zone fuel total to determine total enroute fuel.

11.8.7. Compute preflight endurance using procedures in **paragraph 11.3.3**

**11.9. Multi-Leg Fuel Planning. (T-1)** See AF Form 4116, page 3. A multi-leg fuel plan becomes necessary when a mission includes multiple stops where fuel is unavailable. Use the following procedure for multi-leg fuel planning; assume a three leg mission with legs labeled A, B, C, and D in succession:

11.9.1. Begin with the final destination leg (C to D) and fuel plan as normal to obtain required ramp fuel.

11.9.2. Next, fuel plan the leg preceding the final destination leg (B to C). Include the required ramp fuel from the C to D leg as identified extra fuel. Do not include alternate fuel or holding fuel unless those totals exceed the required ramp fuel for the C to D leg. Use 1,000 lbs. for approach and landing.

11.9.3. Plan the next preceding leg (A to B) as in **paragraph 11.8.2**

11.9.3.1. Unidentified extra is only entered for the first mission segment (A to B). ***NOTE:*** Fuel requirements must be verified at each stopover airfield. Requirement must be recomputed whenever the planned burn off changes; for example, enroute altitude changes, actual cargo/passenger load differs from the estimate, holding is accomplished, diversion to alternate is required, etc. ***NOTE:*** Regardless of the number of mission segments involved, fuel planning is always accomplished by planning the last leg's requirements first. The remaining leg requirements are planned in the reverse order to be flown until the refueling airfield is reached.

**11.10. ETP Computations. (T-1)** Wind Factor and ETP Data Computations are required on Category I routes or Category I portions of routes when the total time between the last suitable airfield (LSAF) and the first suitable airfield (FSAF) is 5 hours or more. Suitable airfields are those within 100 NM of flight planned course centerline meeting weather, fuel, weight bearing and minimum runway requirements (IAW **Chapter 5**).

11.10.1. In-flight ETP. Re-compute the ETP when the actual arrival over any reporting point prior to the ETP exceeds 15 minutes ahead or behind time when the change was caused by erroneous wind information. If the change was caused by factors other than a change in the wind (i.e. slow TAS or deviation for weather), simply compute a new ETA to the ETP, as the ETP itself will not have changed. ***NOTE*:** Wind factor and ETP computations are not required for search missions.

11.10.2. Wind Factor Data: ***NOTE*:** In the following paragraphs for wind factor computation convenience, LSAF means after level-off, abeam or over LSAF, or closest planned checkpoint or radio aid within 100 NM of LSAF. FSAF means abeam or over FSAF, closest planned checkpoint or radio aid within 100 NM of FSAF, descent point, or destination. Use any of the options in the ETP options graph, **Figure 11.1** Specify the option used in the ETP computations section of the AF Form 4116. Record computations in the ETP computations section.

11.10.2.1. TOTAL **-** Compute the average ground speed (GS) between LSAF and FSAF. Divide the total distance between the two end points by the total time between the two points: Total Distance Total Time = Average GS Subtract average flight planned true airspeed (TAS) from average GS to obtain the total wind factor. WF = Average GS - Average TAS

11.10.2.2. 1st Half. Compute the average GS between LSAF and approximate midpoint between LSAF and the FSAF. Subtract flight planned average TAS from the computed average GS to obtain the 1st half wind factor.

11.10.2.3. 2nd Half. Compute the average GS between the approximate midpoint and the FSAF. Subtract flight planned TAS from the computed average GS to obtain the 2nd half wind factor.

11.10.2.4. ETP Data**:**

11.10.2.4.1. DISTANCE (LSAF TO FSAF). Enter the total distance (regardless of level off) from or abeam the LSAF along course from departure to or abeam the FSAF along course toward destination.

11.10.2.4.2. T( )MIN. The flight time from the ETP to the FSAF or return to the LSAF.

11.10.2.4.3. TOTAL TIME TO FSAF - T = TIME TO ETP**.** Subtract the time, T( )MIN, from the total flight plan time to the FSAF. TIME TO ETP is the total time from departure to the ETP (departure and takeoff may not necessarily be the same). Compute and record ETA to ETP by adding TIME TO ETP to departure time.

11.10.2.4.4. Signature Block. Sign the form after completing the flight plan portion (or verifying the CFP) and completing the time and fuel analysis, wind factor, and ETP data.

**11.11. In-Flight Procedures. (T-1)**

11.11.1. The navigator will monitor the primary command radio unless directed otherwise by the PIC. The navigator will record ATC clearances and monitor the read back. This will normally include all ATC instructions involving departure, enroute, and approach procedures. This requirement does not apply to ATC instructions requiring immediate execution by the pilot, or when such action interferes with the timely performance of other critical flight duties.

11.11.2. Departure and Approach Monitoring. Immediately after takeoff, crosscheck all available flight instruments with the aircraft radar, IDS (if equipped), moving map, and hard copy charts to ensure the aircraft remains clear of all obstacles. During all instrument arrivals and departures, use all appropriate navigation aids to ensure an accurate flight profile. During arrivals and departures, open the appropriate terminal instrument procedure plate to monitor all phases of the terminal procedure. Immediately notify the pilots of any deviations. Assist in clearing for other aircraft when possible and practical, but not to the detriment of monitoring proscribed terminal procedures. Unless directed otherwise by the PIC and never to the detriment of safety, confine activities to these critical duties during all terminal phases of flight.

11.11.3. Flight Following. The navigator will flight follow on all IFR/Category II missions using a suitable aeronautical chart IAW **paragraph 11.5**

11.11.4. Compute a TAS check when portions of the planned route transiting oceanic/Category I airspace of 3 hours or more. Use procedures in **paragraph 11.15**

11.11.5. Malfunctions or loss of onboard navigational capability, which degrades required navigation performance, will be immediately reported to ATC and annotated on the flight log. Subsequently, follow procedures IAW **paragraph 11.12.2**

11.11.6. Conduct in-flight fuel management procedures when portions of the planned route transiting oceanic/Category I airspace are 5 hours or more.

11.11.7. Heading Deviation Checks. (Not applicable to dual INU aircraft) Heading deviation checks are required when portions of the planned route transiting oceanic/Category I airspace are 3 hours or more.

**11.12. Flight Records Completion (AF Form 4116). (T-1)** Flight progress will be recorded for Category I routes of 3-hours or longer. Record enough detail to reconstruct the mission. Units may publish local standards for log procedures in the unit supplement. See AF Form 4116, page 5.

11.12.1. Standard Log Procedures. The AF Form 4116 will consist of planning and in-flight progress data. The form will be completed in accordance with this regulation and local supplements in sufficient detail as to fully evaluate or reconstruct the flight. Page 1 of the form will be completed when a CFP is not available on Category I routes. Page 4, the in-flight section, will be used to record present positions and spot readings. The procedures below are designed to accommodate a wide range of HC-130 navigation equipment configurations.

11.12.1.1. As soon as practical after level-off or coast-out, whichever occurs last, navigators will verify aircraft position by either navigation aid fix or radar fix.

11.12.1.1.1. Record the fix in AF Form 4116 Section VIII.

11.12.1.1.2. At the time of the fix record the primary navigation solution in AF Form 4116 Section VI, VIII or in the REMARKS portion of Section X. Corresponding deltas or coordinates for all other navigation solutions should also be recorded.

11.12.1.1.3. At the time of the fix record as a minimum: GMT, present position, true heading, spot wind, TAS, altitude and ETA to the next waypoint in AF Form 4116 Section IX.

11.12.1.2. After coast out and in between hourly fixes, record current position every 30 minutes on AF Form 4116, Page 4 in Section VI, VIII or in the REMARKS portion of Section X.

11.12.1.3. Plot the current position every hour or within 10 minutes of crossing an oceanic/Category I reporting point, whichever occurs first.

11.12.1.3.1. Record the GMT, current position of the primary navigation system, true heading, spot w/v, true air speed, altitude, ETA to the next point, and corresponding deltas for all other navigation solutions.

11.12.1.4. Between recorded positions, record spot readings in the NAV DATA/REMARKS portion of section IX of the AF Form 4116 at regular intervals to allow for calculating a Dead Reckoning Position (DR) in the event of a navigation system failure.

11.12.1.4.1. Spot readings will include as a minimum, time, heading, drift angle, ground speed, wind vector, and true airspeed.

11.12.1.5. As soon as practical prior to coast-in, navigators will verify aircraft position by either navigation aid fix or radar fix.

11.12.1.5.1. Record the coast-in fix in AF Form 4116 Section IX.

11.12.1.5.2. At the time of the coast-in fix record the primary navigation solution in AF Form 4116 Section VI, VIII or X. Corresponding deltas or coordinates for all other navigation solutions will also be recorded. Spot readings for the coast-in fix are the same as the coast-out fix.

11.12.2. In the event of a navigation system failure (INU or GPS) full log procedures will be implemented. Beginning at the last plotted position, compute a DR up to the present position. Plot a fix or most probable position (MPP) at a minimum of once per hour. A dead reckoning position associated with the fix/MPP will be plotted on the chart prior to plotting the position. If the navigation system failure is resolved, the navigator may resume log procedures as outlined in **paragraph 11.12.1**

11.12.2.1. At the time of the fix/MPP record the GMT, current position, true heading, spot w/v, true air speed, altitude and ETA to the next point.

**11.13. Inflight Fuel Management Procedures. (T-1)**

11.13.1. Record the fuel readings listed below at level off time and regular time intervals (coinciding with entries on aircraft performance record), not to exceed 1 hour and 30 minutes. Use the worksheet on page 4, Section VII of the AF Form 4116 to complete in-flight fuel management computations.

11.13.1.1. ETA DEST. Best known arrival time at destination.

11.13.1.2. TIME. Time of the fuel reading.

11.13.1.3. TERMINAL FUEL FLOW.

11.13.1.4. FUEL FLOW [Current].

11.13.1.5. AVG FUEL FLOW. Calculate by adding terminal fuel flow to current fuel flow and dividing the sum by 2.

11.13.1.6. FUEL REMAINING. Fuel quantity at time of calculation. In the interest of safety, use the lower of the calculated or gauge fuels.

11.13.1.7. MIN DIV/OVHD FUEL. Required overhead fuel (item 13 of the fuel plan).

11.13.1.8. DIFF. Subtract O/H Fuel from FUEL REM.

11.13.1.9. FUEL ETE. Calculate using formula in **paragraph 11.13.2.3**

11.13.1.10. ETE DEST. Subtract TIME from ETA DEST.

11.13.1.11. EXTRA TIME. Subtract ETE DEST from FUEL ETE. Report this value to the pilot. If this is a negative value, check the computation and values for errors. If they are correct, evaluate your destination options.

11.13.2. Use the following formulas to accomplish in-flight fuel management:

11.13.2.1. **(Terminal fuel flow + Present fuel flow)** / 2 = Average Fuel Flow

11.13.2.2. Present fuel – Overhead fuel = Usable Fuel

11.13.2.3. Usable fuel / Average fuel burn rate = Fuel ETE

11.13.2.4. Fuel ETE – ETE to destination = Extra Time

11.13.3. AF Form 4125, **Range Control Chart** may also be used for in-flight fuel management.

11.13.3.1. Manual Construction (see **Figure XXXX**).

11.13.3.1.1. "POINT NUMBER" represents the approximate level-off point (initial cruise altitude), 25, 50, 75, and 100 percent of the flight plan distance as indicated on AF IMT 4116 or CFP.

11.13.3.1.2. Column A, "ENROUTE AND DESTINATION FUEL": AF IMT 4116 takeoff fuel minus enroute reserve fuel.

11.13.3.1.3. Column B, "ENROUTE FUEL": The fuel (enroute + identified extra fuel) planned to be burned off by the time each of the given points defined in **paragraph 11.13.3.1.1** are reached.

11.13.3.1.4. Column C, "MINIMUM FUEL": Subtract Column B (ENROUTE FUEL) from column A (ENROUTE AND DESTINATION FUEL). This fuel is the minimum, at each given point, to fly from that point to destination with sufficient fuel to make a missed approach (if required), continue to the destination alternate, hold, make the planned approach, and land with 6,000 pounds of fuel. Minimum fuel will also include any identified extra fuel needed overhead the alternate (e.g., excess holding, for succeeding legs, etc.). The minimum fuel at the 100 percent point should be the same as required overhead fuel.

11.13.3.1.5. Column D, "DISTANCE": The flight plan distance for the given points listed in **paragraph 11.13.3.1.1**, obtained from AF IMT 4116. This can be graphically depicted as either distance flown or distance remaining.

11.13.3.1.6. "DISTANCE FLOWN/REMAINING": Label the nautical miles to the destination along the horizontal scale. For distance flown start with 0 at the left and allow the major blocks to represent convenient increments of mileage. ***NOTE*****:** The distance scale should be expanded to the maximum to give as large a presentation as possible.

11.13.3.1.7. Draw a vertical line on the graph representing total distance to destination and label this line with the destination name.

11.13.3.1.8. Estimated Performance/Minimum Arrival Fuel Lines. Estimated Performance is based on planned fuel at T/O, level off, and arrival plotted parallel to the minimum fuel line.

11.13.3.1.9. A "minimum arrival" line will be constructed by plotting fuel in column C versus distance in column D.

11.13.3.1.10. An "estimated performance" line will be constructed by plotting a line parallel to the minimum arrival line based on planned take-off, level off and arrival fuel. ***NOTE:*** The difference between the estimated performance line and the minimum arrival line is reserve and unidentified extra fuel. If required, plot vertical lines representing ETPs at the appropriate distance flown/remaining.

11.13.4. The navigator may terminate these procedures one hour from destination, when the Category I route segment is completed, or at the discretion of the PIC.

**11.14. Heading Deviation Check Procedures (Not applicable to Dual INU aircraft). (T-1)**

11.14.1. Heading checks should be computed in Section V of AF Form 4116, page 4. The heading deviation check solves for "deviation" (DEV) for all heading reference systems. The SCNS allows the navigator to input compass "deviation" for the number one and two compasses. In this case reverse the sign of the "deviation" to arrive at "deviation correction" and input corrections into the SCNS FLT PRMTR 2-3 page. ***NOTE***: Compass deviation is not necessarily constant over time or after significant course changes. Navigators should reconfirm deviation on Category I routes every 3 hours or after planned course changes of greater than 30 degrees. ***EXCEPTION****:* A deviation check is not required on flights transiting Category I routes of less than three hours if: 1. The aircraft is equipped with two or more operable heading systems (the standby compass is not considered a system for this requirement). 2. The difference between systems does not exceed 2-degrees.

11.14.2. Deviation checks not required for Dual INS equipped aircraft.

11.14.3. Single INS/SCNS Heading Checks. Record and compare the INS/SCNS magnetic heading with all compass systems.

**11.15. True Airspeed (TAS) Check Procedures (not applicable for HC-130(H)N aircraft). (T-1)**

11.15.1. TAS checks should be computed in Section IV of AF Form 4116, page 4. Accomplish as soon as practical or within one hour of initial cruise altitude. Record time of the check and altitude on the pressure altimeter. If using free air temperature gauge, record indicated outside air temperature (IOAT). Use the heat of compression table on AF Form 4116 to convert IOAT to true outside air temperature (TOAT). If using SCNS temperature, record TOAT.

11.15.2. Navigators can use 0 knots for indicated airspeed (IAS) to calibrated airspeed (CAS) correction and minus 3 knots for CAS to equivalent airspeed (EAS) correction for TAS above 270 (or minus 2 knots if less than or equal to 270).

11.15.3. ITAS – Indicated TAS. Record the TAS reading from the TAS meter and the SCNS/INS or other computer (if the aircraft is so equipped). Record the difference between computed TAS and this reading in the CORR block.

**11.16. Grid Procedures.** Refer to AFPAM 11-216 for definitions and formulae. ***NOTE:*** Entering arguments include a Grid convergence factor which can only be obtained from hardcopy NGA charts. Current automated flight planning tools utilizing CADRG NGA charts do not provide these values.

11.16.1. SCNS Grid Procedures. For description of SCNS Grid operations procedures, refer to T.O. 1C-130-1-4, Section II.

11.16.2. Manual Grid Procedures. (T-1) The navigator will use the AF Form 4116, page 7/Section XI when grid navigation procedures are required. Block entries are as follows:

11.16.2.1. Time. Time of heading/system heading observation.

11.16.2.2. TH. Observed/computed true heading.

11.16.2.3. CA/LONG. Enter +W **–**E longitude (polar chart) or convergence angle.

11.16.2.4. GH. Observed/computed grid heading.

11.16.2.5. GYRO #1, GYRO #2. On aircraft equipped with two independent gyro stabilized systems with numbers corresponding to aircraft systems (e.g. C-12 No. 1, N-1 No 2), circled number denotes the primary steering gyro. On aircraft whose systems are not numbered or do not correspond to the aircraft system, identify the primary steering gyro in “REMARKS”.

11.16.2.6. GR. Gyro reading. Record the reading from the primary compass.

11.16.2.7. PREC. The amount of precession since the last heading shot (period precession): GH – GR = PREC.

11.16.2.8. RATE/CUM. The hourly precession rate based upon the precession indicated at the time of observation. Precession rate is derived from the period precession and the applicable elapsed time period (since the last compass reset). Example: 2 degrees precession in 40 minutes equals a 3 degrees/hour precession rate. This entry is required only when period precession is greater than one degree. The cumulative portion of the block is used for tracking the cumulative precession rate once a false latitude has been set.

11.16.2.9. LAT. The mid-latitude between the current observation and the next proposed observation.

11.16.2.10. FALSE LAT. The false latitude setting being used to eliminate precession. This entry is required only when a false latitude setting is used.

11.16.2.11. RESET. Whenever a gyro is reset, place a check mark in this block.

11.16.2.12. GC. Measured grid course to the next checkpoint.

11.16.2.13. DRIFT. The number of degrees (+ or **-**) of drift.

11.16.2.14. DGH. Desired grid heading. Apply anticipated DRIFT to GC.

11.16.2.15. RT/2 CORR. See formula on the bottom of the AF Form 4116.

11.16.2.16. IGH. Initial grid heading. Used for alter heading.

11.16.2.17. GRID ENTRY. Apply grivation (GRIV) to Magnetic Heading (MH) to obtain desired grid heading (DGH); or apply (LONG) or convergence angle (CA) to True Heading (TH) to obtain DGH. See formulas on the AF Form 4116. ***NOTE:*** Grid convergence factors can only be obtained from hardcopy NGA charts. Current automated flight planning tools utilizing CADRG NGA charts do not provide these values.

11.16.2.18. GRID EXIT. Apply GRIV to DGH to obtain MH; or apply LONG or CA to DGH to obtain TH. See formulas on the AF Form 4116.

11.16.3. En route Requirements:

11.16.3.1. The Grid Entry/Exit section of the AF Form 4116 will be completed prior to heading reference changes. When entering grid operation, spot grivation should be applied to the computed magnetic heading to obtain DGH. The aircraft will be established on the computed magnetic heading prior to resetting the heading references. When exiting grid, the computed magnetic headings will be the target heading when the compass systems are reset. In both cases, the computed magnetic headings will be compared to the flight plan to verify the accuracy of the courses measured and conversion data used. This will ensure the validity of initial entry headings and provide precise target headings for exit.

11.16.3.2. Normally, the grid heading will be checked each 30-minutes after grid entry. If the compasses are precessing 3 degrees per hour or less, hourly checks may be obtained after the first hour.

11.16.3.3. Determine the precession information for each gyro after each heading check. When a gyro's precession is greater than 1 degree, reset the gyro to correct grid heading. When the period precession is 1 degree or less, the navigator may either reset the gyro or treat the precession as zero.

11.16.3.4. Whenever the period precession is greater than 1 degree (optional for 1 degree or less), the hourly precession rate may be removed by use of a false latitude setting. When the combined earth rate and gyro precession are less than +15 degrees/hour, the false latitude setting will totally compensate for precession. Two considerations are necessary:

11.16.3.4.1. Predicted precession becomes zero.

11.16.3.4.2. It may be necessary to adjust previous DR and air plot positions if the precession rate changes at subsequent heading checks. If this occurs, adjustments normally will be small and have negligible effect on DR and air plot accuracy; however, the effect should be considered.

11.16.3.5. To determine false latitude correction, enter the earth rate table with the desired latitude and extract the tabulated earth rate value. Algebraically combine the earth rate value and the observed hourly precession rate (use cumulative precession rate once a false latitude has been set). Re-enter the earth rate table with the combined value and extract the corresponding false latitude.

11.16.3.6. Only 15 degrees/hour can be removed by a false latitude setting. When the sum of earth and primary gyro precession rates exceeds +15 degrees, the navigator must artificially steer the aircraft (in effect, the aircraft will fly a gentle arc) to compensate for the amount of precession in excess of +15 degrees/hour. The formula used to correct the DGH to an initial grid heading (IGH) to fly appears on the AF Form 4116 as "RT/2 CORR" (note that the formula produces a correction, so the precession rate must be given its opposite sign). The precession rate used in the formula must be adjusted to reflect the time period in the DR ahead. When "carrying" precession as suggested above, the navigator should consider several aspects of the navigational problem: ***NOTE:*** When precession exceeds 15 degrees per hour, consider the compasses unusable.

11.16.3.6.1. If alter headings are not made at heading check times, precession will have accumulated by alter heading times and a correction (opposite sign of precession) should be applied to the IGH using the total precession correction portion of the AF Form 4116.

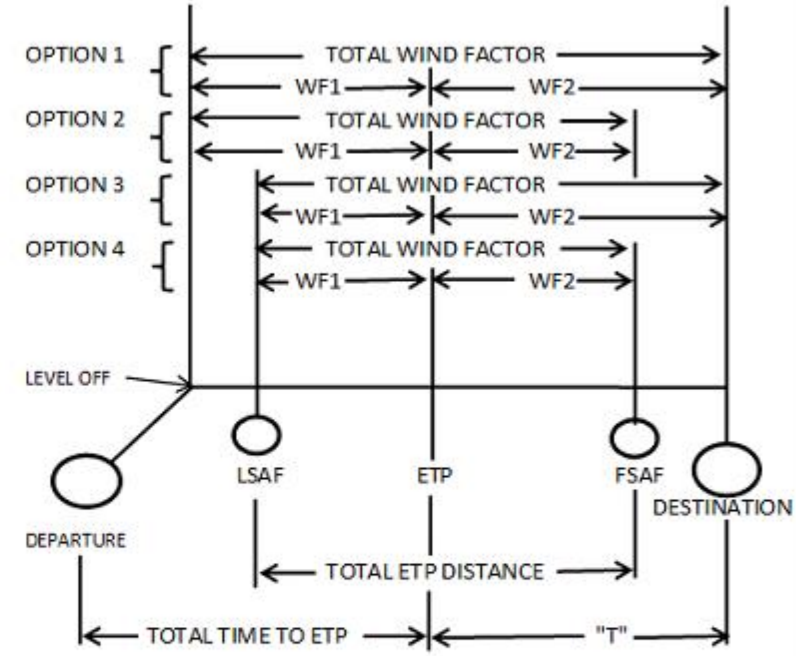
11.16.3.6.2. If the precession rate changes at subsequent heading checks, it may be advisable to adjust previous DR and air plot positions described at **paragraph 11.16.3.4.2**

11.16.4. Miscellaneous Procedures:

11.16.4.1. Normally, when changing charts or crossing the 180 degree meridian, only the reference changes; the heading of the aircraft is not altered. The change is made by comparing the grid courses and applying the difference to the gyro reading (old chart GC 350 degrees; new chart GC 331 degrees; GR 353; 350 – 331 = 019 = 334; reset the gyro to read 334).

11.16.4.2. Always recheck computations and formulas when a radical change in precession is observed.

**Figure 11.1. ETP Calculations.**




**Computations.**

1. WIND FACTOR COMPUTATION (USE OPTION 1, 2, 3 OR 4):

A. TOTAL WIND FACTOR:

$$\frac{\text{TOTAL WIND FACTOR DISTANCE}}{\text{TOTAL WIND FACTOR TIME}} = \text{AVERAGE GS}$$

B. FIRST HALF WIND FACTOR (WF 1):

$$\frac{\text{DISTANCE FROM BEGIN PT TO APPROX MID-POINT}}{\text{TIME FROM BEIGN PT TO APPROX MID-POINT}} = \text{AVERAGE GS}$$

AVERAGE GS – PLANNED AVERAGE TAS = WF 1

C. SECOND HALF WIND FACTOR (WF 2):

$$\frac{\text{DISTANCE FROM APPROX MID-POINT TO END PT}}{\text{TIME FROM APPROX MID-POINT TO END PT}} = \text{AVERAGE GS}$$

AVERAGE GS – PLANNED AVERAGE TAS = WF 2

2. ETP COMPUTATION

A. $$\frac{\text{TOTAL ETP DISTANCE (LSAF TO FSAF)}}{\text{(WF2 - WF1) + 2 * (PLANNED AVG TAS)}} = \frac{\text{“T” (TIME IN MIN FROM ETP TO FSAF)}}{60}$$

B. TIME (FROM DEPARTURE) TO ETP = TOTAL TIME TO FSAF - “T”

**Figure 11.2. Example AF Form 4116.**

| C-130 NAVIGATOR FLIGHT PLAN AND LOG | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | I. FLIGHT DATA | | | | | | | | | | | | | |
| | | AIRCRAFT COMMANDER: CAPT HANS O'BRICK | | | | | | | | | AIRCRAFT TAIL #: 64-0527 | | | | |
| | | NAVIGATOR: LT BAG O'DONUTS | | | | | | | | | T/O TIME | | | | |
| | | DATE: 1 NOV 11 | | | | | PARKING SPOT: G-4 | | | | PROPOSED: 1320 | | | | |
| | | FROM: KCHS | | | | | TO: LPLA | | | | ACTUAL: 1300 | | | | |
| WPT | TO | TAS<br>ALT | TC | WV<br>DA | TH | VAR | MH | GS | ZONE DIST | TOTAL DIST | ZONE TIME | TOTAL TIME | ETA | ATA | A/B |
| 1<br>KCHS | N 32 53.92<br>W 080 02.43 | | | | | | | | | | | | 1300 | | |
| L/O | | 195 | 076 | 260/12<br>0 | 076 | 7W | 083 | 207 | 104 | 104 | +30 | +30 | 1330 | 1332 | 2B |
| 2 | N 33 32.80<br>W 077 00.00 | 270<br>17.0 | 077 | 260/40<br>-1 | 076 | 9W | 085 | 309 | 52 | 156 | +10 | +40 | 1342 | 1341 | 1A |
| 3 | N 34 07.36<br>W 074 06.03 | ✓<br>✓ | 077 | ✓<br>0 | 077 | 11W | 088 | 309 | 152 | 308 | +30 | 1+10 | 1411 | 1411 | 0T |
| 4 | N 34 37.60<br>W 071 00.27 | ✓<br>✓ | 079 | ✓<br>0 | 079 | 13W | 092 | 309 | 157 | 465 | +31 | 1+41 | 1441 | 1440 | 1A |
| 5 | N 35 20.80<br>W 067 58.83 | ✓<br>✓ | 074 | ✓<br>-1 | 073 | 15W | 088 | 309 | 155 | 620 | +30 | 2+11 | 1511 | 1510 | 1A |
| 6 | N 36 38.32<br>W 064 57.39 | ✓<br>✓ | 072 | ✓<br>-1 | 071 | 16W | 087 | 309 | 155 | 775 | +30 | 2+41 | 1541 | 1540 | 1A |
| 7 | N 37 13.12<br>W 059 54.99 | ✓<br>✓ | 075 | ✓<br>-1 | 074 | 18W | 092 | 309 | 252 | 1027 | +48 | 3+29 | 1629 | 1629 | 0T |
| 8 | N 38 17.92<br>W 053 04.59 | ✓<br>✓ | 079 | ✓<br>0 | 079 | 18W | 097 | 309 | 332 | 1359 | 1+04 | 4+33 | 1733 | 1732 | 1A |
| 9 | N 38 43.84<br>W 046 57.39 | ✓<br>✓ | 085 | ✓<br>+1 | 086 | 17W | 103 | 309 | 289 | 1648 | +56 | 5+29 | 1829 | 1828 | 1A |
| 10 | N 39 05.44<br>W 040 58.83 | ✓<br>✓ | 086 | ✓<br>+1 | 087 | 16W | 103 | 309 | 281 | 1929 | +54 | 6+23 | 1923 | 1922 | 1A |
| 11 | N 38 56.80<br>W 038 01.71 | ✓<br>✓ | 094 | ✓<br>+2 | 096 | 15W | 111 | 308 | 138 | 2067 | +26 | 6+49 | 1949 | 1949 | 0T |
| 12 | N 38 56.80<br>W 035 00.27 | ✓<br>✓ | 090 | ✓<br>+1 | 091 | 14W | 105 | 308 | 142 | 2209 | +27 | 7+16 | 2016 | 2018 | 2B |
| 13 | N 38 43.84<br>W 030 58.35 | ✓<br>✓ | 094 | ✓<br>+2 | 096 | 12W | 108 | 308 | 189 | 2397 | +36 | 7+52 | 2052 | 2055 | 3B |
| 14 | N 39 22.72<br>W 028 27.15 | ✓<br>✓ | 072 | ✓<br>-1 | 071 | 12W | 083 | 309 | 125 | 2522 | +24 | 8+16 | 2116 | 2020 | 4B |
| 15<br>LPLA | N 38 45.71<br>W 027 05.45 | ✓<br>✓ | 120 | ✓<br>+2 | 122 | 11W | 133 | 309 | 74 | 2596 | +16 | 8+32 | 2132 | 2135 | 3B |
| | | | | | | | | | | | | | | | |
| ALT<br>LPAZ | N 35 58.28<br>w 025 10.24 | 270<br>10 | 140 | 260/12<br>2 | 142 | 10W | 152 | 275 | 141 | 2737 | +31 | 9+02 | 2203 | | |

| II. FUEL/ETP PLANNING | | |
|---|---|---|
| NAV: LT BAG O'DONUTS | OPERATING WT: | 86.0 |
| AC: CAPT HANS O'BRICK | CARGO/PAX WT: | 14.0 |
| TAIL #: 64-0527 | RAMP FUEL: | 55.0 |
| DATE: 40848 | RAMP WT: | 155.0 |
| CALLSIGN: REACH 4527 | TAKEOFF WT: | 153.7 |
| | TIME | FUEL |
| 1. ENROUTE | 8+32 | 39.6 |
| MEFF 3400<br>2. RESERVE (MEFF) | +45 | 2.6 |
| 3. CONTINGENCY (N/A AFSOC)<br>3. HOLDING (AFSOC Only) | +15 | 0.8 |
| ALTERNATE +<br>4. MISSED APPROACH | +31 | 2.2 |
| APPROACH/ 1.0/4.0<br>5. LANDING | | 5.0 |
| IDENTIFIED<br>6. EXTRA | | 0.0 |
| DEPRESSURIZATION<br>6A. FUEL | | 1.7 |
| TOTAL (1 thru 6A)<br>7. TAKEOFF | | 51.9 |
| 1.3<br>8. TAXI | | 1.3 |
| 9. REQUIRED RAMP | | 53.2 |
| 10. ACTUAL RAMP | ENDURANCE<br>11+37 | 55.0 |
| UNIDENTIFIED<br>11. EXTRA | | 1.8 |
| MIN DIV OR (2+4+5+WRF)<br>12. REQ OVHD DEST | | 9.8 |

1. Note: Wing Relieving Fuel (WRF), when required, must be included as required overhead fuel in Block 12.
2. Note: The 4000 LB landing fuel should be included as part of any required WRF.
3. Note: AFSOC Only. Block 12, REQ OVHD DEST (2+3+4+5+WRF).

NAVIGATOR SIGNATURE

Joseph Bag O'Donuts, 1 Lt, USAF

| | | | | |
|---|---|---|---|---|
| CLIMB TEMP DEV: +05 | CRUISE TAS | INIT CRUISE ALT | HIGHEST ACC ALT | DRAG INDEX |
| CRUISE TEMP DEV: +05 | 270 | 17.0 | 17.3 | +17 |
| TIME TO CLIMB (TTC) | DISTANCE TO CLIMB (DTC) | | CLIMB TAS | FUEL TO CLIMB (FTC) |
| +30 | 93 NM | | 195 | 2450 |

ENROUTE FUEL COMPUTATION WORKSHEET

| ZONE | GROSS WEIGHT | ALTITUDE | TIME | F/F PER ENGINE | F/F TOTAL | FUEL | ZONE FUEL |
|---|---|---|---|---|---|---|---|
| A CLIMB | 153.7 | | TOTAL: 8+32 | | | | 2.5 |
| TTL CLIMB FUEL | - 2.5 | | TTC - 0+30 | | | | |
| B. START CRUISE | 151.2 | 17.0 | CRUISE TIME = 8+02 | 1230 | 4920 | 39.5 | |
| CRUISE ZONE FUEL | - 39.5 | | | D. AVG CRUISE FUEL FLOW | 4620 | 37.1 | + 37.1 |
| C. END CRUISE | 111.7 | 17.0 | | 1080 | TFF 4320 | | TOTAL FUEL = 39.6 |

ETP CALCULATION

| LSAF | MDPT | | FSAF |
|---|---|---|---|
| KCHS | N 38 17 | W 053 00 | LPLA |
| DIST 1360 | TIME 4+36 | DIST 2597 | TIME 8+32 |
| - 91 | - 30 | - 1360 | - 4+36 |
| = 1269 | = 4+06 | = 1237 | = 3+56 |
| GS 310 | WF1 +40 | GS 315 | WF2 +45 |

DIST (LSAF TO FSAF) ( 2597 ) / (WF2-WF1) + 2(TAS) ( 545 ) = T( 286 )MIN / ^60

TOTAL TIME TO FSAF - T = TIME TO ETP

8+32 - 4+46 = 3+46

ETP METHOD 1 2 3 4 (CIRCLE ONE)

DEPRESSURIZATION FUEL CALCULATION

| | |
|---|---|
| ETP 'T' Time | 4+46 |
| x 1000 F/F Per Hour | 4750 |
| + 30 min reserve (MEFF) | + 1700 |
| Depress Fuel Required | = 6450 |
| - Total of Blocks 2+4 | - 4800 |
| Difference (Positive number will add to Block 6A) | 1650 |

Notes:

**IV. TAS CHECK**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| TIME | 1345 | 1510 | | |
| ALT (PA) | 17.0 | 19.0 | | |
| IOAT | -6 | -10 | | |
| TOAT | -14 | -18 | | |
| IAS | 207 | 200 | | |
| CAS | 207 | 200 | | |
| EAS (-2 ≤ 270 < -3) | 205 | 198 | | |
| TAS | 269 | 270 | | |
| - ITAS | 275 | 276 | | |
| CORR | -6 | -6 | | |
| - COMP TAS | 270 | 270 | | |
| CORR | -1 | 0 | | |

**STANDARD TEMPERATURE**

| ALT | TEMP | ALT | TEMP | ALT | TEMP | ALT | TEMP | ALT | TEMP |
|---|---|---|---|---|---|---|---|---|---|
| 110 | -7 | 160 | -17 | 210 | -27 | 260 | -37 | 310 | -46 |
| 120 | -9 | 170 | -19 | 220 | -29 | 270 | -39 | 320 | -48 |
| 130 | -11 | 180 | -21 | 230 | -31 | 280 | -41 | 330 | -50 |
| 140 | -13 | 190 | -23 | 240 | -33 | 290 | -43 | 340 | -52 |
| 150 | -15 | 200 | -25 | 250 | -35 | 300 | -44 | 350 | -54 |

**HEAT OF COMPRESSION**

| TAS | TEMP | TAS | TEMP |
|---|---|---|---|
| 190 - 210 | -4 | 278 - 288 | -9 |
| 211 - 230 | -5 | 289 - 300 | -10 |
| 231 - 246 | -6 | 301 - 310 | -11 |
| 247 - 263 | -7 | 311 - 319 | -12 |
| 264 - 277 | -8 | 320 - 325 | -13 |

**V. DEVIATION CHECK**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| TIME | 1355 | 1630 | | |
| TH (INU) | 076 | 075 | | |
| MAG VAR | +12.0W | +17.7W | | |
| MAG HDG | 088.0 | 092.7 | | |
| DEV | +0.5 | +1.0 | | |
| NO. 1 CH | 088.5 | 093.7 | | |
| DEV | -0.4 | -1.7 | | |
| NO. 2 CH | 087.6 | 091.0 | | |
| DEV | +8.0 | +7.3 | | |
| STBY CH | 096.0 | 100.0 | | |
| DEV | 0 | -0.2 | | |
| COMPUTER | 088.0 | 092.5 | | |

**VII. IN-FLIGHT FUEL MANAGEMENT**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| RETA DESTINATION | 2132 | 2133 | | | | | | | |
| TIME | 1332 | 1430 | | | | | | | |
| TERM FUEL FLOW | 4.3 | | | | | | | | |
| FUEL FLOW | 5.1 | 5.0 | | | | | | | |
| AVG FUEL FLOW | 4.7 | 4.7 | | | | | | | |
| FUEL REMAINING | 51.3 | 46.2 | | | | | | | |
| MIN DIV/REQ OVHD | 9.8 | | | | | | | | |
| DIFFERENCE | 41.5 | 36.4 | | | | | | | |
| FUEL ETE | 8+50 | 7+45 | | | | | | | |
| ETE DESTINATION | 8+00 | 7+03 | | | | | | | |
| EXTRA TIME | 0+50 | 0+42 | | | | | | | |

**VI. FIX/COMPUTER POSITION**

| TIME | GPS/SCNS | INS-1 | DVS / INS-2 |
|---|---|---|---|
| 1335 | N 33 28.0 W 077 35.9 | N 33 28.1 W 077 36.0 | N 33 29.1 W077 37.4 |
| 1405 | N 34 02.8 W 074 35.9 | 155 / 0.4 nm | 230 / 1.1 nm |
| | | | |
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**VIII. RADAR/NAVAID DATA**

| TIME | STATION | READING | CORR | CORR READING |
|---|---|---|---|---|
| 1335 | CHS | 090/127 | -5W | 085/127 |
| 1335 | ILM | 173/58 | -7W | 166/58 |
| 2052 | FRS | 207/38 | -12W | 195/38 |
| | | | | |
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| | | | | |

**IX. IN-FLIGHT DATA**

CLEARANCE/REMARKS: RWY 03 RDR VECT ON CRS; CLIMB 17.0 DEPT FREQ: 231.5 SQ: 3128

1500 - CLIMB 19.0; 1510 Nav SYS Fail - loss of GPS/INS; 1700 - CLIMB 21.0; 1900 - CLIMB 23.0;

| GMT | POS | NAV DATA | TC / GC | W/V | | TH / GH | VAR | MH | DEV CORR | CH | TAS | AD/GD | GS | NEXT | DIST | TIME | ETA | TEMP | NAV DATA/REMARKS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DC | | | | | | | | TIME | | WP | | | | ALT | TIME | HDG | DA/GS | W/V | # |
| 1300 | T/O | | | | | RWY 03 RDR VCTR DCT WPT 1 | | | | | | | | | | | | ° | 1345 | 086 | -1/309 | 259/39 | 270 |
| | | | | | | | | | | | | | | | | | | M | 1355 | 088 | -1/308 | 258/37 | 270 |
| 1335 | △ | N 33 28.0 | | 257 | 38 | 076 | | | | | 270 | | 308 | 2 | 29 | +06 | 1341 | -14° | 1405 | 087 | -1/308 | 258/38 | 270 |
| | | W 077 35.9 | | | | | | | | | | | | 3 | 152 | +30 | 1411 | 17.0M | 1411 | 091 | 0/308 | 258/38 | 270 |
| 1435 | G-I □ | N 34 31.9 | | 263 | 41 | 079 | | | | | 270 | | 309 | 4 | 27 | +05 | 1440 | -14° | 1425 | 091 | 0/309 | 262/42 | 270 |
| | | W 071 33.8 | | | | | | | | | | | | 5 | 155 | +30 | 1510 | 17.0M | 1435 | 091 | 0/309 | 260/40 | 270 |
| 1505 | G-I □ | N 35 02.3 | | 261 | 40 | 078 | | | | | 270 | | 309 | 5 | 26 | +05 | 1510 | -18° | 1445 | 087 | +1/309 | 260/40 | 270 |
| | | W 068 29.1 | | | | | | | | | | | | 6 | 155 | +30 | 1540 | 19.0M | 1455 | 087 | +1/309 | 261/39 | 270 |
| 1535 | ○ | | 086 | | | 087 | +16W | 103 | +1 | 104 | 270 | 154 | 309 | | | | | ° | 1505 | 104 | +1/309 | 262/41 | 270 |
| | | | | +1L | | | | | | | | +30 | | | | | | M | 1515 | 103 | +1/309 | 260/40 | 270 |
| 1535 | DOP □ | N 35 56.2 | | 262 | 40 | 087 | | | | | 270 | | 309 | 6 | 26 | +05 | 1535 | -18° | 1525 | 105 | +1/309 | 260/40 | 270 |
| | | W 065 28.5 | | | | | | | | | | | | 7 | 252 | +48 | 1623 | 19.0M | 1535 | 104 | +1/309 | 260/40 | 270 |
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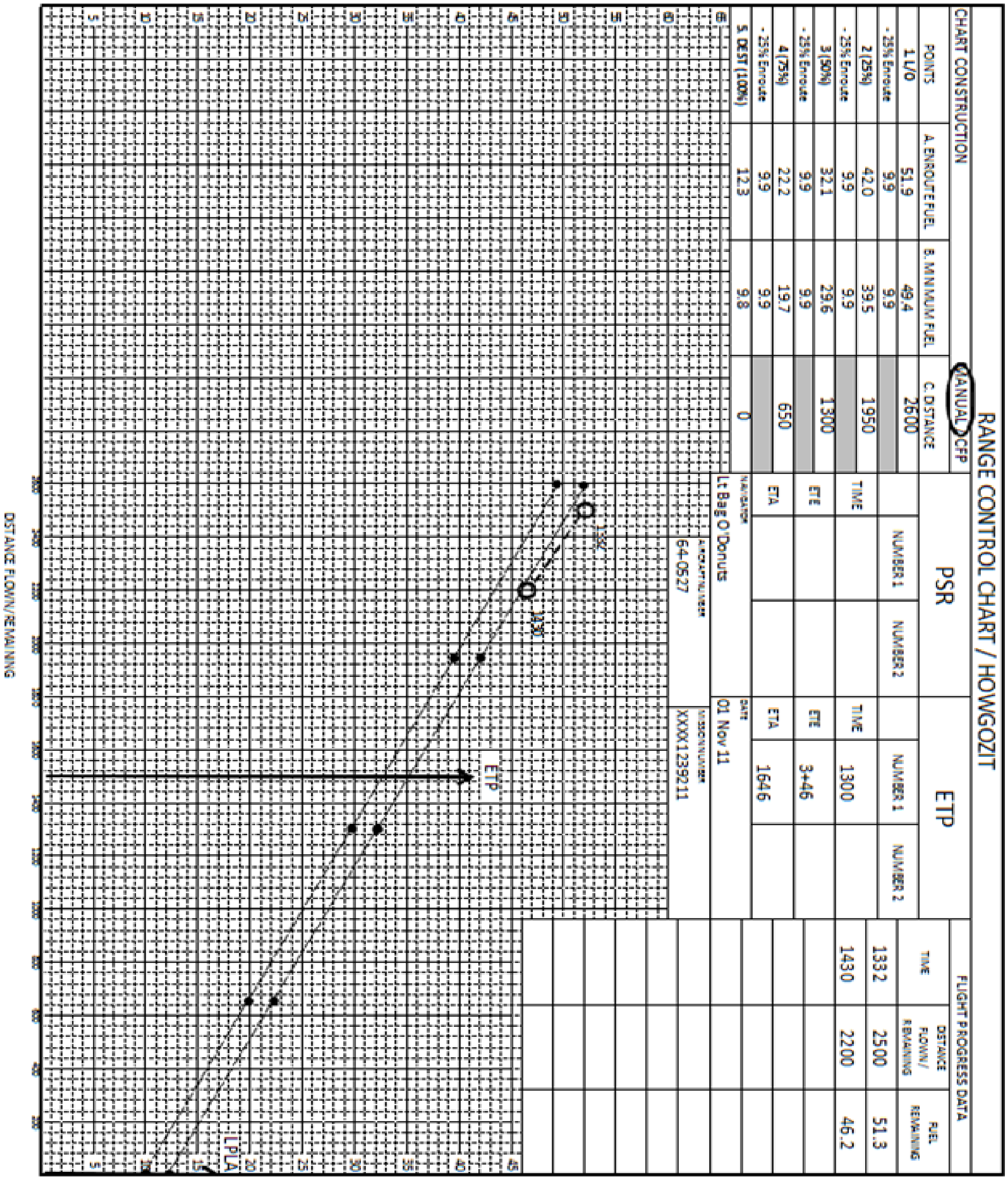
**Figure 11.3. Example AF Form 4125.**



# Chapter 12

## FLIGHT ENGINEER PROCEDURES AND FORMS

**12.1. General.** In addition to duties in the flight manual and other applicable technical orders, flight engineers will comply with the procedures and duties specified in this instruction. The PIC may assign other mission-related duties to the flight engineer as necessary.

**12.2. Authority to Clear Red X. (T-1)** Flight engineers are not normally authorized to clear a Red X. In a situation where the aircraft is on a Red X and qualified maintenance personnel are unavailable, the flight engineer may obtain authorization to clear the Red X from the home station MXG/CC or designated representative. Other crewmembers are not authorized to clear a Red X. ***EXCEPTION:*** The flight engineer may clear Red Xs for engine intakes and exhaust, engine panels and covers, pitot covers, gear pins, and SPR drains when qualified maintenance personnel are not available, unless prohibited by the home station MXG/CC, OG/CC, or representative.

**12.3. In-Process Inspections (T-1).** All flight engineers must be aware of their responsibility to perform in-process inspections when clearing Red X symbols. During the assembly or reassembly of an item at those stages where further assembly will prevent the required inspection of the item, an in-process inspection will be performed. Document the in-process inspection IAW T.O. 00-20-1).

**12.4. Aircraft Servicing (T-1).** Flight engineers normally are not required to refuel or defuel C-130 aircraft; however, the flight engineer is qualified and authorized to accomplish these duties when maintenance personnel are unavailable. This policy is designed for support of the aircraft and mission while away from home station. The flight engineer will use T.O. 00-25-172 and T.O. 1C-130H-2-12JG-10-1, *Job Guide—Ground Handling, Fuel System Servicing and Concurrent Servicing*, during all servicing operations. When concurrent servicing is required the flight engineer will be the Concurrent Servicing Supervisor (CSS) and follow instructions from T.O. 00-25-172 and T.O. 1C-130H-2-12JG-10-1. If ground support personnel are not available, the PIC will designate other crewmembers to assist the flight engineer.

**12.5. Forms Management.** In addition to the procedures in T.O. 00-20-1 and AFI 11-401, the flight engineer will assist the pilot in maintaining the AFTO Form 781. Verify the exceptional release is signed before starting engines and re-signed, if necessary, at en route stops. After each flight, ensure the number of discrepancies (if any), landings, and flight duration time(s), etc., are entered on AFTO Form 781H. Review all AFTO Form 781A discrepancies and ensure clear, detailed entries are made, symbols, date discovered, and when discovered codes are entered for each discrepancy and the discovered blocks are signed.

**12.6. Flight Monitoring. (T-1)** The flight engineer will monitor aircraft systems during all phases of flight and ground operations. Notify the pilot of all abnormal indications and take action as required.

12.6.1. Maintain outside vigilance when flight deck duties allow.

12.6.2. Monitor the primary radio, inter-plane radio, interphone systems, and HOT LISTEN.

12.6.3. Advise and assist the pilot in maintaining required climb and cruise power.

12.6.4. Monitors aircraft instruments, cross checks aircraft altitude and terrain clearance using NVGs and the radar altimeter during modified contour/low level operations.

12.6.5. Ensure pilot/copilot radar altimeter is set correctly for the specific low level altitude.

12.6.6. Flight engineers will compute zero and 50 percent obstacle clearance speeds for all low level operations, prior to entering low level environment.

12.6.7. During low level operations the flight engineer will state “190 Knots” when enroute airspeeds decay to 190 Knots. Flight engineers will further announce to the aircrew in 10 knot increments below 190 knots (e.g. “180”, “170”) until airspeed exceeds 190 knots. ***EXCEPTION*:** not required for planned slowdowns (HAAR, airdrops, etc.).

12.6.8. Assist in field acquisition and visually checks that the LZ is clear of obstacles.

12.6.9. State "17,000" over interphone when any engine torque approaches this value. ***NOTE:*** In the event of an inadvertent over-torque see **Table 12.1** for required actions:

**Table 12.1. Over-Torque Conditions and Required Actions.**

| **Over-Torque Condition** | **Required Action(s)** |
|---|---|
| Torque > 19,600 in lb. < 21,500 | 781A entry; historical tracking only, no inspection required. |
| Torque >21,500 in lb. < 23,000 in lb. | 781A entry; visual inspection within 25 hours. |
| Torque > 23,000 in lb. < 23,260 in lb. | 781A entry; maintenance required for NDI and engine mounts change within 25 flight hours. Reduction Gearbox may require change if gearbox oil pressure is lower than before over-torque. |
| ***NOTE:*** The 25 flight hour criteria are based on flight time to return the aircraft for maintenance. Aircraft that experience an over-torque exceeding 23,000 in pounds of torque are to immediately return the aircraft for inspection/maintenance.<br><br>***WARNING*:** Failure to comply with these criteria could result in catastrophic structural failure. | |

12.6.10. Notify the pilot when any of the following is noted:

12.6.10.1. Deviation of more than 200 feet from assigned altitude or 10 KIAS from assigned airspeed.

12.6.10.2. The aircraft configuration is incorrect for the maneuver being performed.

**12.7. Tactical Checklists.** When the pilot initiates a tactical checklist, read and ensure timely completion of all checklist items.

**12.8. C-130 Takeoff and Landing Data (TOLD) Cards. (T-1)**

12.8.1. Takeoff and immediate landing data for the departure airfield will be completed prior to takeoff.

12.8.2. TOLD Cards. Use AF IMT Form 4064V2 and AF IMT Form 4063V2 (mini card) or locally produced and approved at OGV level, C-130 TOLD Card. Complete data applicable to the type of takeoff and landing to be made (i.e. landing distance for normal landing; ground roll for Maximum Effort landings).

12.8.3. Record computed data in accordance with the flight manual and this volume.

12.8.4. Base all performance calculations on 95 percent engine efficiency without nose wheel steering unless mission requirements dictate otherwise. Reference **paragraph 5.15** for guidance concerning when nose wheel steering is authorized for performance data calculations.

12.8.5. Accomplish TOLD card computations using performance manual data, MAJCOM-approved tabulated data or TOLD computer [approval authority is the MAJCOM Stan/Eval function].

12.8.5.1. Record adjusted speeds to be used; i.e., record minimum control speed (one engine inoperative in ground effect) as take-off speed if minimum control speed is higher than computed takeoff speed.

12.8.5.2. Following initial takeoff and landing, only affected speeds need to be re-accomplished if favorable conditions afford an additional margin of safety in all other areas (e.g., gross weight decreases due to fuel burnoff, while pressure altitude and temperature remain constant). New data is required for pressure altitude changes of 1,000 feet, gross weight changes of 5,000 pounds, or temperature change of 5 degrees C.

12.8.6. When stop-and-go operations are planned, the runway remaining for takeoff must be greater than or equal to balanced or unbalanced CFL, whichever is greater. If maximum effort take-off is utilized, runway remaining must be greater than or equal to MFLMETO corrected for VMCA.

12.8.7. The minimum TOLD card computations (airspeeds) required for a termination landing are: air minimum control speeds, obstacle clearance speed, three engine climb speed, 50 and 100 percent flap landing speeds. The flight engineer will post flaps up approach speed for aircraft equipped with GCAS/GPWS during night or IMC approaches.

12.8.8. Pararescue/Jumper Minimum Operating Speed (PJ MOS). The flight engineer will compute a PJ MOS for all static line personnel drops and post this information on the card. Compute data using power off stall speed with 50 percent flap setting at 30 degree bank angle plus 5 knots.

**12.9. Aircraft Structural Integrity Program (ASIP). (T-1)** An automated inspection, repair, corrosion and aircraft tracking (AIRCAT) worksheet (electronic or paper copy) will be completed for all flights IAW T.O. 1C-130-101. AIRCAT worksheets will be entered into the AIRCAT reporting system within 72 hours of the flight or return from TDY. Deployed units will establish criteria to input AIRCAT data within a reasonable time period depending on network support of the deployed unit. If unable to obtain connectivity with the AIRCAT server due to austere conditions, units will attempt to inform OGV of the situation and any delays in AIRCAT reporting.

**12.10. AF IMT Form 4108, Aircraft Fuel Usage Log. (T-2)** The AF IMT Form 4108 is sufficient for normal operational requirements and is used as a simple method of recording aircraft fuel usage data. When additional data is required for identifying trends in engine failure, performance, or for special test programs, the directing headquarters will furnish necessary forms and instructions. Maintain AF IMT Form 4108 in accordance with the following paragraphs.

12.10.1. Responsibility. The flight engineer assigned to the flight will complete the AF IMT Form 4108 whenever the navigator completes an AF Form 4116. The log may also be filled out as necessary for training and to maintain flight engineer proficiency. Coordinate with the navigator for fuel reading clock times.

12.10.2. Instructions for AF IMT Form 4108. Form heading entries are self-explanatory.

12.10.2.1. *Block 1 - Fuel Gage Pounds*. Record fuel quantity from the fuel quantity indicators before and after flight. This reading is normally taken prior to engine start with the indicators powered and after flight prior to power being removed from the indicators.

12.10.2.2. *Block 2 - Weight Data.* Record the operating weight and the cargo/passenger weight from the DD Form 365-4. Ramp fuel weight is obtained from Block 1. Use the middle blank space for last minute changes prior to engine start or as otherwise required.

12.10.2.3. *Block 3 - Fuel On/Offload.* Enter the total weight of fuel On/Offload during air refueling.

12.10.2.4. *Block 4 - Pax/Cargo Offload.* Enter the total ammo expenditure weight and or weight of Pax/cargo offload extracted during flight.

12.10.2.5. *Block 5 - Engine Start Z.* Enter the time (GMT) the last engine was started.

12.10.2.6. *Block 6 - Condition.* Enter the symbol depiction per the flight condition as follows:

12.10.2.6.1. WU/TAXI/TAKEOFF - Indicates warm-up, taxi, and takeoff conditions.

12.10.2.6.2. [1□Climb]. Initial climb is indicated by the symbol "1□". Subsequent climbs are shown as "2□", "3□", etc. The number indicates the sequence of segments. Climbs of 4,000 feet or less will not be recorded separately but will be included in the preceding cruise segment. When constant climb is maintained to cruise altitude, use fuel flow reading taken at 2/3 climb altitude. When constant climb cannot be maintained to cruise altitude due to ATC clearances, etc., enter the difference between the sum of the individual fuel quantity gage readings at the beginning and end of the climb.

12.10.2.6.3. Cruise operating conditions are indicated by the number in the cruise sequence and an arrow such as "1□", "2□", etc. Instrument readings will be average for this period. Normally, cruise entries will be no more than 60 minutes. However, for the first cruise immediately prior to en route or step climb and the last cruise prior to descent may be no less than 30 minutes, nor more than 90 minutes.

12.10.2.6.4. Descents are shown as "1□", "2□", etc. Do not confuse descent with the final letdown that occurs when landing procedures begin. The loss in altitude during final letdown is indicated by "L&T". Landing and taxi is that condition from the end of the last entry in the sequence of descents/cruise to engine shutdown on the ramp. Holding time during an approach must be accounted for as an additional cruise condition after descent when necessary (30 minutes holding or more). Descents of 4,000 feet or less will not be recorded separately but will be indicated in the preceding cruise segment. When descent exceeds 4,000 feet, Blocks 10 through 17 need not be accomplished.

12.10.2.6.5. Helicopter Air Refueling (HAAR) Operations. Cruise, climb, or descent time to refueling altitude ends approximately at start of on/offload. Indicate segment with "HAAR 1" or "AR1", "HAAR 2" or "AR 2", etc., in condition Block as appropriate. Blocks 10 through 17 need not be accomplished. Blocks 19, 20, 22, 25, and 28 entries not required for AR. At completion of on/offload, a new cruise, climb, or descent segment will be initiated. ***NOTE:*** Rescue, search, combat, combat support, or any special mission which requires constant variations in altitude and airspeed may use the same procedures as AR/HAAR operations. For this type of condition use an "S 1", "S 2", etc., in the condition *Block 146*

12.10.2.7. *Block 7 - End.* Enter time (GMT) for end of conditions.

12.10.2.8. *Block 8 - Set.* Enter increment time duration for the conditions for WU/TAXI/TO segment. All warm-up and taxi times will be entered in the circle of the SET Block. Takeoff time is computed from brake release to the first change of power (when reduced power procedures are used, compute takeoff time using 2 minutes).

12.10.2.9. *Block 9 - Total.* Enter cumulative total time of SET time excluding the warm-up and taxi times entered in the circle SET time.

12.10.2.10. *Block 10 - OATI.* Enter indicated outside air temperature reading.

12.10.2.11. *Block 11 - OATC/VAR:*

12.10.2.11.1. OATC. Enter corrected outside air temperature as determined from the appropriate performance manual, SCNS computer system, or mission computer(s) as required.

12.10.2.11.2. VAR. Enter temperature variation from standard ICAO temperature.

12.10.2.12. *Block 12 - HP.* Enter the pressure altitude for the condition with altimeter set at 29.92 Hg.

12.10.2.12.1. For climb, enter HP for 2/3 the intended climb altitude when that altitude is known. This figure will represent 2/3 pressure altitude of the actual climb. If a climb starts at 15,000 feet and concludes at 30,000 feet, you compute the pressure altitude for 2/3 of the 15,000 difference which is 10,000 feet. This Hp added to the 15,000 foot beginning Hp equals 25,000 feet Hp.

12.10.2.12.2. For cruise, enter actual HP.

12.10.2.12.3. When descents exceed 4,000 feet, Blocks 10 through 17 need not be accomplished.

12.10.2.13. *Block 13 - Cruise Ceiling.* Enter the 4-engine cruise ceiling for the aircraft from the performance manual.

12.10.2.14. *Block 14 - Cruise IAS.* Enter airspeed required to maintain the desired true airspeed. Obtain from the appropriate performance manual.

12.10.2.15. *Block 15 - Torque.* Enter the torque value to maintain the desired true airspeed.

12.10.2.16. *Block 16 - 3-Engine Service Ceiling.* Enter 3-engine service ceiling from the performance manual.

12.10.2.17. *Block 17 - 3-Engine Driftdown IAS.* Enter 3-engine driftdown airspeed from the performance manual.

12.10.2.18. *Block 17 - Engine Instruments F/F LBS/HR.* Enter the average individual fuel flow readings and total for the period.

12.10.2.19. *Block 19 - Period (Fuel Used).* Enter the fuel used for the engines for the period as computed using the total of the fuel flow readings. ***NOTES:*** **1.** For fuel used during WU/TAXI, use 50 pounds per minute. For fuel used during takeoff, use 300 pounds. **2**. Enter all fuel used, fuel remaining, and gross weights in thousands and round off weights to the nearest hundred. (***EXCEPTION*****:** Engine instrument fuel flow pounds per hour will be in a complete form.) **EXAMPLE:** 135,700 = 135.7; 127,360 = 127.4.

12.10.2.20. *Block 20 - Extra (Fuel Used).* Enter the extra fuel used during the flight condition period for fuel jettisoning, APU, etc.. Enter the fuel transferred to the receiver during AR in this Block.

12.10.2.21. *Block 21 - Total (Fuel Used).* Enter the cumulative total of fuel used for successive conditions. This Block represents all fuel consumed to the END clock time entered in Block 7. AR start new condition (cruise, climb, or descent), after refueling with "0" (zero) fuel used.

12.10.2.22. *Block 22 - Period (Calc Fuel Remaining).* Enter the amount of fuel consumed (Block 19 plus Block 20) for the flight condition as determined by calculation.

12.10.2.23. *Block 23 - Total (Calc Fuel Remaining).* Enter the total amount of the calculated fuel remaining by subtracting the amount in Block 22 from the amount in Block 23 of the previous flight condition. This total reflects the calculated fuel remaining at the END clock time in Block 7. AR condition, enter cumulative total of fuel (indicated by individual gage reading) on board aircraft after refueling.

12.10.2.24. *Block 24.* This Block is unlabeled to facilitate entering total ramp fuel from Block 2 weight data. Enter the ramp calculated fuel aboard obtained by either measurement with the dipstick and applying any known correction factor or as indicated by the total of the fuel quantity indicators. On reverse side of the form this Block is used to carry forward the previous quantity from the front side.

12.10.2.25. *Block 25 - Gage Period (Gage Fuel Remaining).* Enter the fuel used for the flight condition as determined by fuel gage readings for the present condition as compared to the fuel gage readings for the previous condition. For fuel used during WU/TAXI, use 50 lbs/min. Fuel used during takeoff use 300 pounds.

12.10.2.26. *Block 26 - Total (Gage Total).* Enter total of fuel as indicated by the individual fuel quantity gages. AR condition, enter cumulative total fuel of fuel (individual gage readings) onboard aircraft after refueling.

12.10.2.27. *Block 27* **-** This Block is unlabeled to facilitate the entering the total ramp fuel from Block 2, Weight Data. Enter the ramp calculated fuel aboard obtained by either measurement with the dipstick and applying any known correction factor or as indicated by the total fuel quantity indicators. On reverse side of the form this Block is used to carry forward the previous quantity from the front side.

12.10.2.28. *Block 28 - Fuel Used.* Enter the fuel used, obtain from total of Blocks 19 and 20.

12.10.2.29. *Block 29 - On/Offload.* After the aerial delivery of troops or equipment, air refueling, or ammo expenditure enter the weight loss or gain to indicate actual gross weight of the aircraft in Block 30.

12.10.2.30. *Block 30 - End Gross Weight.* Enter the aircraft gross weight at the end of the period. This weight is found by subtracting the fuel used for this period (Block 21 from the previous ending gross weight). If an entry is made in Block 29 (On/Offload), this weight must also be added or subtracted from the previous ending gross weight to arrive at the correct END Gross Weight figure.

12.10.2.31. *Block 31* **-** This Block is unlabeled to facilitate entering the total ramp gross weight from Block 2, Weight Data. On reverse side of the form this Block is used to carry forward the previous weight from the front.

12.10.2.32. *Block 32 - Remarks.* Enter any remarks or observations including instrument readings pertinent to the flight which you feel are noteworthy.

**12.11. DD Form 791, In-flight Issue Log (T-1).** The flight engineer will record all in-flight transfers from C-130 tanker aircraft to any receiver aircraft outside of the same operations group on the DD Form 791, IAW AFMAN 23-110CD, *Air Force Supply Systems Electronic Publishing Library*. This form will also be accomplished for Forward Area Refueling Point (FARP) off-loads in excess of 1000 lbs.

12.11.1. DD Form 791 will be filled out for all in-flight, jettison, and FARP offloads of fuel per AFMAN 23-110CD.

12.11.1.1. Current operations will provide flight engineers with all available mission profile/receiver data prior to flight.

12.11.1.2. DD Form 791 data will be entered into Reliability and Maintainability Information System (REMIS) by maintenance personnel.

12.11.2. **Completed Form(s) Handling.** Completed forms will be reviewed for completion by the flight engineer prior to turn in at MX debrief.

12.11.3. **Instructions for Completing DD Form 791:**

12.11.3.1. *Mission Date and Time.* From: Enter the JULIAN date and ZULU takeoff time; i.e., Date 117, Time 0753. To: Enter landing date/time in same manner.

12.11.3.2. *Tanker Organization and Home Station.* Enter the tanker squadron of assignment; i.e., 0129 RQS, 0102 RQS, 0210 RQS (use preceding zeros for 4 digit number).

12.11.3.3. *Tanker M/D/S.* Enter the tanker MDS; i.e., HC-130P, or MC-130P.

12.11.3.4. *Tanker Serial Number.* Enter 8 digit tanker serial (tail) numbers; i.e., 66-0213 is entered as 66000213, 64-1743 is entered as 64001743.

12.11.3.5. *Fuel Grade.* Enter type of fuel off loaded; i.e., JP-4, JP-8, Jet-A.

12.11.3.6. *Aircraft Command.* Enter the receiver aircraft command of assignment; i.e., ACC (Air Mobility Command), ANG (Air National Guard), AFRC (Air Force Reserve Command), AFMC (Air Force Materiel Command), etc. Non-Air Force receivers will be entered as USN (Navy), USMC (Marine), and USA (Army). Foreign military sales will be FMS.

12.11.3.7. *Receiver MDS.* Enter the receiver aircraft MDS; i.e., MH-53J, MH-60, HH-60, MH-47.

12.11.3.8. *Receiver Tail Number.* Enter the receiver tail number in the same manner as tanker tail number; i.e., 8 digit number with zeros between year and last 4 digits of tail number. For example, 79-1952 would be entered as 79001952. At present, tail numbers are not required for non-Air Force receivers.

12.11.3.9. *Receiver Call Sign.* Enter the receivers call sign; i.e., Cowboy 22, Cobra 99.

12.11.3.10. *Unit of Assignment and Aircraft Home Station.* Enter the aircraft, not pilots, unit of assignment and home station in the same manner as the tankers; i.e., 0079, Davis-Monthan AFB, NM, 0071, Moody AFB. ***NOTE*:** If fuel was dumped, enter JETTISON in this block. If fuel is for an FMS receiver, enter the FMS case number and country.

12.11.3.11. *Pounds Off Loaded.* Enter the off load to each receiver aircraft, or jettisoned in pounds (no gallon entry required).

12.11.3.12. *Boom Operators Name and Grade.* Self-explanatory.

12.11.3.13. *Total Mission Offload.* Enter the total fuel off loaded or jettisoned.

12.11.3.14. *Mission Number.* Enter the mission number for the mission or leg being flown in the margin above mission date and time.

12.11.3.15. Prepare a separate entry for each aircraft refueled/FARPed.

12.11.4. After each mission, if a fuel off-load was performed, complete the AFTO Form 781H IAW 00-20-1.

**12.12. Hostile Environment Operations.** Remove all non-essential equipment from the aircraft prior to a combat mission.

**12.13. Hostile Environment Repair Procedures (HERP). (T-1)** HC-130 aircrews will use AFSOCM 11-201 for HERP procedures and requirements. Approval authority outlined in AFSOCM 11-201 also applies. ***NOTE:*** During combat combat/contingency operations, COMAFOR is the approval authority for steps or procedures annotated with “(B)”. If a combat or contingency situation makes prior coordination impractical or impossible, complete the necessary procedure and notify the approval authority at the earliest opportunity.

# Chapter 13

## LOADMASTER PROCEDURES

**13.1. General.** Loadmasters are responsible for all duties described in technical orders, Air Force instructions, and any other regulatory guidance that applies to their crew position. The PIC may assign other duties as necessary to aid in ensuring mission success.

**13.2. Specific Duties. (T-1)** In addition to the responsibilities listed above, the loadmaster is responsible for, supervises, performs, and/or participates in the following:

13.2.1. Responsible for: load planning, verifying proper aircraft configuration, aircraft pre-flight, operation of aircraft equipment, preparation of DD Form 365-4 (Form F), the safe movement of cargo and personnel into and out of the aircraft, ensuring proper tie-down of cargo/equipment, handling of troops/passengers, and verifying cargo/passengers against required documentation. Additionally, the loadmaster is responsible to remain in the cargo compartment with passengers on board and during takeoffs and landings with either cargo or passengers on board.

13.2.2. Supervises the loading, tie-down, off-loading of cargo, baggage and mission equipment.

13.2.3. Performs: cargo compartment anti-hijacking duties IAW **Chapter 7** and/or as directed by the PIC; scanner duties during helicopter air-to-air refueling and on flights conducted in high threat environments; hot refueling supervisor duties and/or panel operator duties during hot refueling/FARP operations.

13.2.4. Visual signals listed in ATP-56(B) Part 3.

13.2.5. Participates in: the aerial delivery of equipment, supplies, and personnel, to include manually assisting the exit of door bundles (i.e., container ramp load, RAMZ, bike bundles, etc.) from the ramp and door/paratroop door(s).

13.2.6. The loadmasters are responsible for rear quadrant visual threat detection. Ensure cabin lights (except electroluminescent lights (EL), if installed) are off from ingress to egress in hostile areas at night.

13.2.7. When in a threat environment, crew members/pararescue stationed at the scanner positions will hold the AN/ALE-40/47 remote flare dispenser switches.

13.2.8. Mask lights or install black out kit as necessary. See AFI 11-2HC-130 CL-2 for items to be masked.

**13.3. Additional Aircraft Loadmaster Responsibilities. (T-1)**

13.3.1. Normally all air freight, fleet service, and servicing personnel are authorized to perform assigned duties on HC-130 aircraft when escorted by an authorized individual. Air freight personnel are responsible for completion of cargo documentation, palletizing, and movement of cargo to and from the aircraft. They will advise the loadmaster of destination, size, weight, and type of cargo (classified, hazardous, etc.) to permit proper positioning; coordinate traffic activities that may affect loading and off-loading; and assign sufficient air freight loading personnel for cargo handling. Air freight personnel are responsible for safe positioning of material handling equipment and cargo to and from the aircraft. Air freight personnel under the direction of the loadmaster, prepare the aircraft for loading or stowing loading equipment if the aircraft is not to be reloaded, tie-down, and physically off-load cargo. If cargo, aircraft equipment, or aircraft structure are damaged during loading or off-loading, or if loading personnel are injured, the loadmaster will notify the PIC, command post, or terminal operations officer.

13.3.2. At locations with no air terminal or traffic personnel, the shipper assumes responsibilities in **paragraph 13.2.1**

**13.4. Emergency Exits and Safety Aisles. (T-1)** Maintain emergency exits and safety aisles IAW AFI 11-2HC-130V3, Addenda A.

**13.5. Air Cargo Restraint Criteria.** Restrain cargo IAW TO 1C-130A-9 or AFI 11-2HC-130V3, **Chapter 5**, during infil and exfil operations.

**13.6. Passenger Handling.** Ensure all classified equipment is covered prior to passenger boarding. The loadmaster is the key figure concerning good passenger relations. Be aware of the doubts and fears which may arise in the minds of passengers and anticipate their questions and actions.

13.6.1. Passengers may move about the cargo compartment. Good judgment must be exercised on the number of passengers allowed out of their seats at one time. Encourage passengers to keep seat belts fastened when seated.

13.6.2. Do not allow passengers to lounge on or tamper with equipment, cargo, or baggage.

13.6.3. **(T-0)** Ensure that classified equipment remains covered during the entire mission when passengers are onboard and ensure passengers are denied access to this equipment.

**13.7. Troop Movements. (T-1)** Most personnel carried aboard rescue aircraft are aboard to perform a specific mission. Every effort should be made to advise them of mission progress and deviations. The troop commander will be identified prior to boarding.

13.7.1. Determine if the troop commander has any special requirements prior to departure, and advise the PIC of these requirements, if appropriate.

13.7.2. Determine if specific communications requirements exist and coordinate these requirements with the PIC and/or AMSS.

13.7.3. Determine if there is a need for the troops to perform any type of in-flight rigging. Ensure the aircraft is loaded to accommodate in-flight rigging if required. Inform the PIC prior to in-flight rigging. If turbulence is anticipated, the PIC should inform the loadmaster as much in advance as possible.

13.7.4. Ensure that troops do not have access to aircraft classified equipment during the mission. If troops require access to classified equipment, the requirement should be made known to the PIC prior to the mission.

13.7.5. Passenger Combat Loading. See **Chapter 5** and AFTTP 3-3.HC-130.

13.7.6. Combat Off-load Training. No special authorization is required for combat off-load training using unilateral training loads.

**13.8. Weight and Balance. (T-1)** Accomplish weight and balance for the aircraft IAW T.O. 1-1B-50. A basic handbook of weight and balance containing current aircraft status is maintained by the unit possessing the aircraft and provides a supplemental weight and balance handbook for each aircraft. This supplemental handbook is in a wear-resistant binder and should contain a certified copy of Chart C providing the current basic weight, basic moment, and basic index. The binder will include the applicable TO 1C-130X-5 and sufficient copies of DD Form 365-4. Also maintain AFI 11-2HC-130V3, Addenda A in each binder.

13.8.1. Compute weight and balance by using the Chart E mathematical (moments) method. Compute DD Form 365-4 IAW AFI 11-2HC-130V3, Addenda A.

13.8.2. The weight and balance section of the unit possessing the aircraft is responsible for providing the appropriate agency with information required to keep documents current and accurate.

**13.9. Supporting/Supported Forces Procedures. (T-1)** The loadmasters will ensure forces are properly manifested as passengers. Give one copy of the manifest to the PIC for filing and retain sufficient copies for border clearance. The loadmaster will complete anti-hijacking requirements for forces IAW this volume.

# Chapter 14

## AIRBORNE MISSION SYSTEMS SPECIALIST PROCEDURES AND FORMS

**14.1. General. (T-1)** In addition to the duties listed in the flight manual, other applicable technical orders, and this instruction, the PIC may assign other mission-related duties as necessary. The Airborne Mission Systems Specialist will:

14.1.1. Attend crew briefings to obtain and record all pertinent information on purpose, route of flight, mission objective, and communication requirements. Attend route study if unfamiliar or the PIC directs.

14.1.2. Preflight all communication and required navigation equipment to ensure satisfactory operation. Determines and coordinates frequencies, call signs, and timing for communications systems checks. Keys all secure equipment and makes operational checks of all communications equipment. Load the flight plan and align the inertial navigation system (INS) if directed.

14.1.3. Preflight and ensure IFF/SIF Modes I, II, IIIA, C, and IV are set in accordance with mission requirements.

14.1.4. Advise the PIC of all mission communications requirements.

14.1.5. Reviews the mission CEOI and execution checklists and assists aircraft and mission commander in tracking scenario developments. Coordinate communication requirements, frequencies, and any special procedures necessary to ensure optimum communication coverage is provided. Check applicable Air Tasking Orders and Special Instructions (ATO/SPINS).

14.1.6. Sign out and maintain control of all COMSEC and classified documents required by the during the mission. Annotate safe inventory and complete daily destruction as required. Ensure all COMSEC and classified materials are returned to proper storage facilities. Only AMSSs are authorized access to aircraft installed safes.

14.1.7. As directed by the PIC, establishes and maintains communications with appropriate air and ground control agencies per mission requirements. This may include airborne early warning (AEW), ATC, range control, combat control teams (CCT), landing zones, drop zones, or other controlling agencies.

14.1.8. Encode, decode, and authenticate messages as required. Mission tasking will dictate when and where secure communication is utilized.

14.1.9. Provide a documented record of all pertinent events during the mission using AF IMT Form 4122, **Airborne Radio Log**.

14.1.10. Troubleshoot malfunctioning communication and navigation equipment in flight and ensure discrepancies are annotated on the AFTO form 781.

14.1.11. Establish emergency communication, using national or international procedures, when directed by the AC.

14.1.12. Zeroize all cryptographic devices, IFF/SIF, and clear classified frequencies prior to leaving the aircraft. Remove classified hard drives from computers and secure all classified documents.

14.1.13. Configure and operate carry-on command and control (C2) equipment as directed.

14.1.14. Configure and operate data systems, SCNS, computer display units (CDU), global positioning systems (GPS), airborne computerized communication terminals (ACCT), and other computer/data devices as required.

14.1.15. Monitor aircraft altitude, heading, and position through the CDU and be able to render a position report if required. Be proficient in the use of bulls-eyes, radial/DME and standard ICAO position report formats.

14.1.16. Scan for ground and air threats using night vision devices (NVD) and direct aircraft defensive maneuvers. Operate aircraft defensive systems as required. Scan for terrain/aircraft avoidance during ground and airborne operations.

**14.2. Aircraft Interphone and Radio (T-1).** The AMSS will monitor the primary radio and interphone at all times except when the use of HF or SATCOM precludes monitoring them. The AMSS will notify the pilot before leaving and when returning to his/her duty station.

**14.3. Communication Procedures (T-1).** Procedures used during all phases of a mission are directly related to the type of mission being flown. Each AMSS will be knowledgeable of the operational environments described in the following paragraphs.

14.3.1. Communication Checks. Communication checks made during preflight, en route and postflight will be in accordance with Allied Communications Publication (ACP) 121, *Communication Instructions General (U).* It is the responsibility of the AMSS to be cognizant of OPSEC requirements prior to making any communication checks.

14.3.2. Non-mission Sortie. Most sorties not using either the COMBAT ENTRY/COMBAT EXIT or INFIL/EXFIL checklist will be considered non-mission sorties. Allied Communications Publications (ACP) 121-series, as supplemented, prescribes procedures for HF communication between aircraft and ground stations for most circumstances. All AMSSs must be proficient in the use of these ACP series (**http://jcs.dtic.mil/j6/cceb/acps**/) in addition to *ACP 122, 131, 135, 160 (U.S. Sup 1C), and Joint Army Navy Air Force Publication (JANAP) 146*. Ensure long-range communication, primarily HF and SATCOM secondary, are established prior to departing VHF/UHF range.

14.3.3. Mission Sorties. Any sortie using either the COMBAT ENTRY or INFIL/EXFIL Checklist will be considered a mission sortie. Plan and fly missions using strict radio discipline to deny enemy DF, jamming and intrusion capability and ensure clear channels are available for emergencies. Limit transmissions to only those essential to mission accomplishment and use secure means when possible. Long-range communication channels will be as directed by the mission controlling authority.

14.3.4. Communication Reports. Forward all ATC communication and associated air reports (AIREP) to ICAO aeronautical stations in accordance with FLIP General Planning, FLIP charts, and the FIH. ICAO HF en route position reporting must be in accordance with the FIH and applicable FLIP documents. Pass C2 and all other operational communication through the USAF HF/SSB GCCS or the dedicated command and control station assigned by the mission controlling authority.

14.3.5. Classified Transmissions. If classified transmissions are made during a flight, power will remain applied to the Cockpit Voice Recorder for at least 30 minutes after the final classified transmission is completed

**14.4. Frequency Listing.** **Table 14.1** through **Table 14.5** contain listings of commonly used frequencies, including search and rescue, citizen band, and the Maritime radio presets.

**14.5. Weather Forecasts (T-1).** For all flights outside the local area, the AMSS will obtain the destination and alternate (if applicable) forecasts, to include pressure altitude and temperature, before reaching the equal time point and one hour prior to ETA. When marginal weather is expected, provide the PIC with earlier forecasts and timely updates, to include alternate landing fields. Whenever SIGMETs are received from any source, contact the nearest USAF weather facility to determine mission applicability.

**14.6. Aircrew Information Guides (AIG's).** AIG's are used to consolidate communications information, procedures, policies, etc. for quick reference during mission planning, preflight, in-flight, and post flight duties. Group Stan/Eval is the approval authority for unit AIGs. Each unit maintaining these guides will review them annually for currency, document the review, and forward 1 copy to HQ ACC/A3TV (T-2).

**14.7. AF IMT Form 4122, Airborne Radio Log (T-2).** The AMSS will complete a single AF Form 4122 for each day's flight or flights. Maintaining log entries is the lowest mission priority.

14.7.1. Radio logs are normally unclassified however, if classified information is entered into the radio log, it must be properly marked. Complete the log in accordance with **paragraph 14.8** File completed unclassified logs chronologically in a transitory file. Radio logs will be kept on file for one calendar year. Classified logs will be handled and stored in accordance with current security directives.

14.7.2. An execution checklist may be used on certain flights. If used, annotate times in the appropriate blocks. If the execution checklist is unclassified, it may be attached to the radio log in lieu of duplicate log entries. If the execution checklist is classified, do not attach it to the radio log unless the radio log is also classified. A separate radio log will be maintained at all times.

**14.8. AF IMT Form 4122 Procedures (T-2).** The AF Form 4122 may be completed electronically or by hand. When completed manually, it should be filled out using non-erasable type ink. Complete this form as follows:

14.8.1. Log Heading: Complete the entire log heading on the first page. Headings of subsequent pages need only contain call sign, date, page number, mission, and operator name(s).

14.8.2. Date. Enter the current Zulu date

14.8.2.1. Tactical Callsign. Enter the tactical/mission call sign. If not applicable, enter N/A. If entry of a tactical/mission call sign by itself would make the log classified, enter N/A.

14.8.2.2. ATC Callsign. Enter the normal ATC voice call sign.

14.8.2.3. Mission or Route. Enter point of departure and destination if other than departure point. Plain language, FAA, or ICAO identifiers may be used. LOCAL may be used for training missions originating and terminating at home station. If the departure or destination is classified, use the mission code name.

14.8.2.4. Tail Number. Enter the aircraft tail number, not the aircraft serial number.

14.8.2.5. Squadron. Enter unit to which the aircraft is assigned.

14.8.2.6. Personnel on Board. Enter the total number of souls on board (crewmembers and passengers).

14.8.2.7. Takeoff. Enter Zulu time for takeoff (AFTO Form 781).

14.8.2.8. Land. Enter Zulu time for landing (AFTO Form 781).

14.8.2.9. Total Time. Enter the total flight time (AFTO Form 781).

14.8.2.10. Page __ of __ Pages. Enter the page number. Each sheet of paper, front and back, is considered one page.

14.8.2.11. Aircraft Commander. Enter the aircraft commander's rank and last name.

14.8.2.12. Operator. Enter rank and last name of the AMSS(s).

14.8.3. Time. Enter the GMT (Zulu) time the transmission is completed and acknowledged. For events that warrant noting, but no transmission is completed, enter the time you make the log entry.

14.8.4. To/From. If you are initiating the call, enter the station called in the upper left portion of this block followed by a slant bar (/). If you are called, place the slant bar near the middle of the block and the call sign of the calling station in the right lower portion of this block. Enter NOTE for all notes or comments not involving a radio transmission.

14.8.5. Frequency:

14.8.5.1. Enter the radio frequency used for HF, VHF, and UHF calls unless the frequency is classified. Use the assigned designator for classified frequencies. Unclassified designators, if assigned, may also be used.

14.8.5.2. Enter SATCOM for all calls made over the SATCOM system.

14.8.5.3. Enter LOG for all notes or comments that do not involve a radio transmission.

14.8.6. Message/Remarks:

14.8.6.1. The first entry will be the statement "ON WATCH" followed by the AMSS's signature. The last entry will be the statement "OFF WATCH" followed by the AMSS's signature.

14.8.6.2. AMSSs may exchange watch by using ON WATCH/OFF WATCH entries. The AMSS on watch at the end of the radio day will make an entry indicating the end of the current radio day and a separate entry for the start of the new radio day. The end of the radio day (midnight Zulu) is designated 2400Z, and 0001Z is the beginning of the new radio day. Radio log entries will read "2400 NOTE LOG END RAYDAY" and "0001 NOTE LOG BEGIN RAYDAY."

14.8.7. Abbreviations and operating signals (ACP 131), FLIP abbreviations and other aeronautical related abbreviations may be used in radio log entries. Use brackets, [ ], to enclose important information, simulated transmissions, transmission summaries, or any other information necessary in the log, but not actually transmitted over the radios. Otherwise, enter sent or received information verbatim.

14.8.8. Entry corrections. Make corrections to the form by lining out the incorrect portion and initialing at the end of the lined out portion. Enter the correct information immediately after the lined out portion.

**Table 14.1. CSAR-specific frequencies Search and Rescue Frequencies.**

| **Frequency** | **Usage** | **Mode[1]** | **Authority[2]** |
|---|---|---|---|
| 251.9 MHz | Operational and Training | V | RFA |
| 252.8 MHz | Operational and Training | V | RFA |
| 259.0 MHz | Operational and Training | V | RFA |
| 381.0 MHz | Operational and Training | V | RFA |
| 46.85 MHz | Operational and Training | V | RFA |
| ***NOTES:***<br>1. Modes are V for voice, CW for International Morse Code, and FM for VHF FM.<br>2. The USAF RFA list is the authority for the use of these frequencies. | | | |

**Table 14.2. Distress and Emergency Frequencies.**

| **Frequency** | **Usage** | **Mode[1]** | **Authority[2]** |
|---|---|---|---|
| 2.182 MHz,<br>4.125 MHz,<br>6.125 MHz<br>8.291 MHz<br>12.290 MHz<br>16.420 MHz | Aero/Maritime Survival Craft | V | IAMSAR V1, V3<br>AFMAN 33-120 |
| 2.670 MHz | USCG Emergency Coordination | V | AFMAN 33-120 |
| 3.023 MHz | International Scene of Action SAR | V | IAMSAR V1, V3 |
| 4.835 MHz | AF Crash Boats (General) | V, CW | AFMAN 33-120 |
| 5.680 MHz | SAR Mobile | V | IAMSAR V1, V3 |
| 5.717 MHz | Canadian MACS SAR | C | Canadian IFR Supp |
| 8.364 MHz | Aeronautical Maritime Mobile | CW | IAMSAR V1, V3 |
| 121.5 MHz | Int'l Aeronautical Emergency | V | IAMSAR V1, V3<br>AFMAN 33-120 |
| 123.1 MHz | Aeronautical Mobile | V | IAMSAR V1, V3 |
| 138. 45 MHz | ARRS Scene of Action | V | AFMAN 33-120 |
| 138.78 MHz | Scene of Action | V | AFMAN 33-120 |
| 156.8 MHz | Maritime Mobile VHF Radio-Telephone Service As A Distress, Safety, and Calling (Channel 16) | FM | IAMSAR V1, V3<br>AFMAN 33-120 |
| 243.0 MHz | Int'l Aeronautical Emergency | V | IAMSAR V1, V3<br>AFMAN 33-120 |

| | | | |
|---|---|---|---|
| 282.8 MHz | Int'l Scene of Action SAR | V | IAMSAR V1, V3<br>AFMAN 33-120 |

***NOTES:***
1. Modes are V for voice, CW for International Morse Code, and FM for VHF FM.
2. The International Aeronautical and maritime Search and Rescue (IAMSAR) Manual Volume II, Chapter 2 and Volume III, Section 3, and AFMAN 33-120, *Radio Frequency Spectrum Management*, explain the use of these frequencies, which are authorized in the RFA of the ITU Radio Registration (see following note).
3. The International Telecommunications Union (ITU) Convention of 1959 promulgated Radio Regulations (RR 994, 999, 1107, and 1323) which permit the use of frequencies for general air-to-ship communications uses.

**Table 14.3. Air/Ship/Air Calling Frequencies.**

| Frequency | Usage | Mode[1] | Authority[2] |
|---|---|---|---|
| 4.172 MHz | May be used by any aircraft to communicate with stations (ships) in the maritime mobile service. | V | RR 1178 |
| 6.273 MHz | | V | RR 1178 |
| 8.364 MHz | | CW | RR 1178 |
| 12.546 MHz | | V | RR 1178 |
| 16.728 MHz | | V | RR 1178 |
| 22.245 MHz | | V | RR 1178 |

***NOTES:***
1. Modes are V for voice, CW for International Morse Code, and FM for VHF FM.
2. The International Telecommunications Union (ITU) Convention of 1959 promulgated Radio Regulations (RR 994, 999, 1107, and 1323) which permit the use of frequencies for general air-to-ship communications uses.

**Table 14.4. Citizen Band (CB) Conversion Table.**

| Channel | MHz | Channel | MHz | Channel | MHz | Channel | MHz |
|---|---|---|---|---|---|---|---|
| 01 | 26.965 | 11 | 27.085 | 21 | 27.215 | 31 | 27.315 |
| 02 | 26.975 | 12 | 27.105 | 22 | 27.225 | 32 | 27.325 |
| 03 | 26.985 | 13 | 27.115 | 23 | 27.255 | 33 | 27.335 |
| 04 | 27.005 | 14 | 27.125 | 24 | 27.235 | 34 | 27.345 |
| 05 | 27.015 | 15 | 27.135 | 25 | 27.245 | 35 | 27.355 |
| 06 | 27.025 | 16 | 27.155 | 26 | 27.265 | 36 | 27.365 |
| 07 | 27.035 | 17 | 27.165 | 27 | 27.275 | 37 | 27.375 |
| 08 | 27.055 | 18 | 27.175 | 28 | 27.285 | 38 | 27.385 |
| 09 | 27.065 | 19 | 27.185 | 29 | 27.295 | 39 | 27.395 |
| 10 | 27.075 | 20 | 27.205 | 30 | 27.305 | 40 | 27.405 |

***NOTE:*** In order to be on the correct frequency, ensure HF equipment is set to AM, not Upper Side Band (USB).

**Table 14.5. AN/ARC-513 VHF-FM Non-tactical Preset Frequencies.**

| Channel | MHz | Usage |
|---|---|---|
| Guard 1 | 156.800 | International Maritime Distress (Channel 16) |

| | | |
|---|---|---|
| Guard 2 | 153.800 | Mountain Search and Rescue |
| 1 | 154.920 | State Police (Clemars) |
| 2 | 155.280 | Inter-Hospital Emergency System |
| 3 | 155.340 | Emergency Medical Service |
| 4 | 156.300 | Coast Guard Intercept/Interplane |
| 5 | 156.650 | Coast Guard Bridge-to-Bridge |
| 6 | 162.400 | National Weather Bureau Regional (RCV only) |
| 7 | 162.550 | National Weather Bureau Regional (RCV only) |
| 8 | 164.050 | Federal Aviation Agency (Sector Control) |
| 9 | 168.625 | National Fire Emergency (Airborne) |
| 10 | 168.500 | Bureau of Land Management |
| 11 | 172.600 | US Dept of Interior (Aircraft Safety) |

# Chapter 15

## MISSION PLANNING AND GENERAL EMPLOYMENT PROCEDURES

**15.1. General.** This Chapter provides guidance on mission planning and procedures, requirements and restriction for HC-130 tactical employment. It provides parameters used to employ the techniques and procedures of AFTTP 3-3.HC-130 and other tactics manuals. If a discrepancy exists between this instruction and a tactics manual, the information in this instruction will take precedence.

**15.2. Personnel Recovery Fundamentals.** Personnel Recovery (PR) is the umbrella term for operations focusing on recovering captured, missing, or isolated personnel. Detailed TTPs for the tactical execution of PR are contained in AFTTP 3-3.HC-130.

**15.3. Mission Roles.** HC-130 crews share a common core of training, equipment, and capability to perform the following roles in direct support of PR operations:

15.3.1. Search operations.

15.3.2. Helicopter air-to-air refueling (HAAR).

15.3.3. Forward area refueling point (FARP) operations/hot refueling.

15.3.4. Guardian Angel deployment via infil/exfil or airdrop.

15.3.5. Transload/medical evacuation.

15.3.6. On-Scene Commander (OSC).

15.3.7. Airborne Mission Coordinator (AMC).

15.3.8. Rescue Mission Commander (RMC).

**15.4. Crew Duties. (T-1)** All crewmembers will perform normal crew duties as outlined in appropriate flight manuals and other chapters of this instruction. ***NOTE*****:** All crewmembers will monitor en route progress should an escape and evasion situation develop.

**15.5. Checklists/In-flight Guides.** Amplified tactical checklist and guidance is located in **Attachments 2** through **5** of this instruction. Abbreviated checklists/briefing guides/in-flight guides are located in separate publications, AFI 11-2HC-130V3, CL-1 and CL-2.

15.5.1. The flight engineer reads all tactical checklists unless briefed otherwise by the aircraft commander. (T-1)

15.5.2. AMSS will respond with "Radio" for any required checklist responses.

15.5.3. Checklist items not applicable to the aircraft or mission/event being flown need not be challenged during checklist accomplishment to (e.g., Air Deflector Doors - "Closed and Off" need not be challenged if air deflector doors were not opened).

**15.6. Mission Planning Factors.** Refer to AFTTP 3-3.HC-130 for in-depth mission planning considerations.

**15.7. Aircrew Briefings. (T-1)** Aircrew briefings will be conducted IAW **Chapter 6** of this instruction and the guidance below:

15.7.1. During the mission crew briefing, the aircraft commander will brief all applicable items from the aircraft commander's briefing guide in AFI 11-2HC-130V3 CL-1.

15.7.2. Tactical Briefs. All tactical sorties will include a route study and tactical briefing. The navigator will conduct the tactical briefing and brief all applicably items from the Navigators Briefing Guide located in 11-2HC-130V3 CL-1.

15.7.3. Pilots and navigator are required to attend the tactical route study and brief. It is highly desirable the AMSS attend when duties allow.

**15.8. Night Vision Goggle (NVG) General. (T-1)**

15.8.1. Limitations. All aircrew will be familiar with the limitations associated with NVG use as discussed in AFMAN 11-217V2, Instrument Flight Procedures and AFTTP 3-3.HC-130. ***NOTE*****:** The route study should emphasize NVG limitations and performance factors and their impact on terrain and obstacle clearance.

15.8.2. Preflight. All crewmembers will perform a thorough preflight of their NVGs.

15.8.3. Inflight Requirements. When NVG use is required, the pilots, navigator, flight engineer, loadmaster, airborne mission systems specialist, and scanners should wear them or have them immediately available based on mission requirements.

15.8.3.1. Pilots will wear NVGs with similar acuity and gain. ***WARNING*****:** NVGs and associated components (battery cords, safety cords, and other hardware) can become entangled with the fire handles, overhead panel switches, or other controls. Any interference can cause inadvertent engine shutdown, or repositioning of other critical switches or controls. Extreme care must be exercised by pilots during seat changes and by flight engineers performing duties that involve leaning forward in the seat; i.e. exchanging TOLD cards or adjusting fuel panel switches.

15.8.3.2. Panoramic NVG (PNVG) Usage. AN/AVS-10 PNVGs are only authorized for use by pilots.

15.8.4. Spare NVGs and Batteries. Mission requirements and duration of the deployment will be determining factors for the total number of NVG sets required. The PIC must ensure there is one spare set of preflighted NVGs (can be either the AMSS or Navigator's set). Each crewmember will carry spare batteries for their NVGs.

**15.9. Mountainous Terrain.** For planning and execution, Mountainous terrain is defined as a 500 ft or greater terrain differential in ½ NM or less.

**15.10. Minimum and Emergency Safe Altitudes (MSA and ESA). (T-1)**

15.10.1. Minimum Safe Altitude (MSA). MSA is an intermediate altitude which will provide terrain clearance, yet limit threat detection during situations that require leaving the modified contour profile.

15.10.1.1. Calculate the MSA for en route low level, airdrop and SCAs by adding 500 feet above the highest terrain or obstacle within 3 NM of centerline or planned flight path, whichever is higher, and rounded up to the next 100-foot increment.

15.10.1.2. Calculate the MSA for helicopter air refueling legs by adding 1000 feet (2000 feet in designated mountainous terrain) to the highest terrain or obstacle within 5 NM of centerline or planned flight path, whichever is higher, and rounded up to the next 100-foot increment.

15.10.2. Emergency Safe Altitude (ESA). ESA provides a safe altitude which ensures terrain clearance.

15.10.2.1. A single ESA will be established for the entire route when there are no significant changes in topography. For routes where the terrain does vary significantly, a separate ESA may be established for route segments with similar terrain or obstacle elevations.

15.10.2.2. Calculate ESA by adding 1,000 feet (2,000 feet in designated mountainous terrain) to the highest elevation or obstacle within 10 NM of centerline or planned flight path, whichever is greater, and rounded up to the next 100-foot increment.

**15.11. Chart Requirements. (T-1)**

15.11.1. Planned low level routes will be drawn on a 1:500,000 (TPC or Sectional) or larger scale chart. Use a 1:250,000 (JOG) or larger scale chart for overland threat penetration operations, mountainous NVG low-level operations, and the objective areas, unless not available or of an inferior quality to a TPC. ***WARNING****:* Mixing multiple coordinate data can cause significant navigation and target errors. The consistent use of data for all coordinates greatly reduces these errors. Ensure the same datum is used to derive coordinates for all mission requirements. ***NOTE*****:** Color copies, laminated, and PFPS charts are acceptable forms of hardcopy charts provided the contour and contrast remain intact and the chart is used for preflight route study and the flight. If laminated charts are used, the crew will ensure that the laminate does not degrade the quality or readability of the chart and that all data remains intact. ***NOTE*****:** For local training routes, if a mountainous NVG route has been planned using a JOG and elevations and altitudes are verified, the route may be flown with reference to a TPC or Sectional.

15.11.2. Chart Construction. At a minimum, low-level charts will be annotated IAW **Table 15.2,** Required Chart Annotations. In addition, the following general instructions apply:

15.11.2.1. Use dark ink, pencil, or symbol tapes to portray course lines. Obstacles and other chart entries may be drawn or highlighted in any legible color.

15.11.2.2. The chart code, scale, and edition will be annotated on the chart

15.11.2.3. The current CHUM/ECHUM/DAFIF (review date included) will be annotated on the chart.

15.11.2.4. Course Arrow Box. A course arrow box will be provided for each leg. At a minimum the course arrow box will include leg magnetic course, distance, and MSA. Where the leg is split between two charts, use the course arrow box on both.

15.11.2.5. Print the ESA in bold numbers on the chart. When multiple ESAs are used, or when lengthy strip charts are used, the ESA will be annotated on each chart segment.

15.11.2.6. When stripped charts are used, a larger scale chart (i.e., ONC, JNC) will be prepared by the navigator to allow for major unplanned deviations during critical mission phases and emergency egress.

15.11.2.7. When transitioning from one chart to another, allow a sufficient route overlap.

15.11.2.8. Draw course lines using either point-to-point or radius of turn.

15.11.2.8.1. If using point-to-point, measure true course and distance from point-to-point.

15.11.2.8.2. If using radius of turn see **Table 15.1**

15.11.2.8.3. True course is measured from the end of the turn to the next turn point

**Table 15.1. Radius of Turn.**

| **20 DEGREE BANK TEMPLATE GUIDE (DIAMETER IN INCHES)** | | | | | |
|---|---|---|---|---|---|
| **Scale** | **True Airspeed** | | | | |
| | **150** | **170** | **200** | **220** | **240** |
| **1:500,000** | ¼ | 3/8 | 15/32 | 9/16 | 11/16 |
| **1:250,000** | 17/32 | 25/32 | 15/16 | 1 1/8 | 1 11/32 |
| **1:50,000** | 2 ¾ | 3 ¾ | 4 5/8 | 5 5/8 | 6 3/4 |
| **30 DEGREE BANK TEMPLATE GUIDE (DIAMETER IN INCHES)** | | | | | |
| **Scale** | **True Airspeed** | | | | |
| | **150** | **170** | **200** | **220** | **240** |
| **1:500,000** | 5/32 | ¼ | 9/32 | 11/32 | 13/32 |
| **1:250,000** | 11/32 | 7/16 | 9/16 | 11/16 | 7/8 |
| **1:50,000** | 1 5/8 | 2 3/8 | 2 15/16 | 3 9/16 | 4 3/16 |

15.11.2.9. Annotate appropriate warning and advisory locations on the chart (e.g., 20, 10, 6, and 1 minute).

15.11.2.10. Draw deviation lines when the planned route is different than the course line. Annotate magnetic heading information near these deviation lines (if desired) to aid in dead reckoning during significant turns.

15.11.3. Chart Annotation. Use the annotation symbology provided in AFTTP 3-3.HC-130. and listed below for marking mandatory chart requirements.

15.11.3.1. Start climb points and their associated NVG altitude will be annotated on charts at the required distance to go where the start climb is to be initiated on each leg. Any of the following annotation styles are acceptable: “S/C 17/12/3500” or “S/C 17/3500/12” or “S/C 3500/17/12”. These examples indicate a climb to the reference altitude of 3,500 feet MSL that should be started at 17 NM to go and to be at NVG altitude by 12 NM to go.

15.11.3.2. Start descent points for MCAD conducted in IMC will be annotated and calculated IAW AFTTP 3-3.HC-130 IFR Drop Corridor procedures.

**Table 15.2. Mandatory Chart Requirements (T-1).**

| **ITEM** | **Pilot** | **Navigator** |
|---|---|---|
| Chart Scale, Code, and Edition | M | M |
| Current CHUM/ECHUM/DAFIF (review date included) | M | M |
| Emergency Airfields | M | M |
| Course-line and Deviation Plan (planned flight path) | M | M |

| | | |
|---|---|---|
| Route Width | O | O |
| MSA controlling obstacles | M | M |
| ESA and controlling obstacle | M | M |
| Distance Ticks | M | M |
| Course Arrow Box (will contain the leg magnetic course, distance, and MSA) | M | M |
| Start Climb Points | M (1) | M (1) |
| Start Descent Points | M | M |
| NVG Altitudes | M (1) | M (1) |
| Update Points | O | M |
| Initial Point (IP)/Slowdown Point | M | M |
| DZ / LZ / HAAR / AR Points | M | M |
| Missed Approach Point / SCA Template | O | M |
| Applicable Local Draw Files | M | M |
| Go-Around Path | M | M |
| Re-attack Paths / Options (If used) | M | M |
| ACO Items | M | M |
| Combat Entry/Exit Point | M | M |
| FEBA/FLOT/PDL | A | A |
| Threat Masking/Shadow Graphing | A | A |
| Known Threats | A | A |
| LOCs / Population Centers | A | A |
| Bullseye | A | A |

**M = Mandatory O = Optional A=As required based on mission**

1. Required for NVG low-level operations

***NOTE:*** Charts will be classified accordingly based on the information sources and methods used to obtain data.

15.11.4. Minimum Hardcopy Chart Requirements for Mission Planning and Flight.

15.11.4.1. The Navigator will carry a hardcopy chart (or set of charts as required) that covers all enroute and objective mission areas.

15.11.4.2. Between the pilots, a single hardcopy chart (or a single set of hardcopy charts as required) that covers all mission enroute and objective areas will be carried. The pilot and copilot may share a single low level/objective area chart during flight. If this option is used, both the pilot and copilot must participate in pre-mission route analysis using this single chart(s).

15.11.4.3. An overview chart of at least 1:1,000,000 (ONC) scale should be available to both the navigator and AMSS.

**15.12. Use of Laptop Computers during Flight.** Electro-magnetic Interference (EMI) certified laptop computers and software, such as portable flight planning system (PFPS), are allowed in-flight IAW AFI 11-202V3. Depending on aircraft modification, these laptops can receive positional data from a portable commercial GPS system with external/window mounted antenna or from the navigational system data bus. If used properly, these systems enhance situational awareness (e.g., “Moving Map,” PFPS/ FalconView/TaskView/Threat Overlays, Intel Feeds) and provide an ability to re-plan missions in-flight.

15.12.1. These systems do not replace existing navigation equipment, must not be used as the sole means of navigation, and must not interfere with the accomplishment of normal duties.

15.12.2. Each user must have a back-up paper chart immediately available in case use of the system is denied.

**15.13. Barometric Altimeter Updating.** Altimeter update points should be planned for en route portions of the mission. Sources of update include weather forecast, ground reporting stations, and crew updates. See AFTTP 3-3.HC-130 for altimeter updating procedures.

15.13.1. Obtain an updated altimeter setting as close to the objective area as possible. If this is not possible, use the lowest forecast altimeter setting.

15.13.2. Apply cold weather altimeter corrections to any reference any barometric altitude (MSA, ESA, NVG altitude, drop altitude, SCA profile altitudes, SCA minimums, etc.) used during low level operations whenever the outside air temperature is below 32º F/0º C.

**15.14. Radar Altimeter Usage during Tactical Operations. (T-1)**

15.14.1. Low level Settings. Set radar altimeters no lower than 10% below minimum enroute altitude (i.e. minimum setting of 450 feet for 500 foot NVG modified contour and 180 feet for day threat penetration at 200 feet). ***NOTE:*** During modified contour low level procedures, regardless of the radar altimeter setting used, if the aircraft is below the desired modified contour altitude, a correction to altitude should be made. Do not wait for the low light to illuminate to begin a correction.

15.14.2. Airdrop Settings.

15.14.2.1. Low Altitude Airdrops. The radar altimeter should be set no lower than 10% below drop altitude.

15.14.2.2. High Altitude Airdrops. Set the radar altimeter at the discretion of the aircraft commander.

15.14.3. Any crewmember noting illumination of the "Low" warning light on the radar altimeter will state the word "Low" to indicate this to the pilot flying and the crew.

15.14.4. The pilot and Navigator will use the same radar altimeter setting. ***EXCEPTION*:** When conducting airland operations using the INFIL/EXFIL Checklist.

**15.15. Use of TCAS and GCAS during Tactical Operations. (T-1)**

15.15.1. ETCAS may be operated in TA only mode during low-level operations.

15.15.2. ETCAS will be operated in TA only mode during airdrop and HAAR operations.

15.15.3. GCAS. AUDIO ON/VISUAL OFF or AUDIO OFF/VISUAL ON may be used to set the GCAS system to tactical mode.

**15.16. Minimum Operating Equipment Requirements. (T-1)** The minimum operating equipment required for tactical employment events is contained in **Table 15.3** Aircrew experience level and mission factors may dictate greater equipment requirements than those listed**.**

**Table 15.3. Minimum Operating Equipment Requirements (T-1).**

| Event | Navigation Solution (Note 1) | Radar | Pilot's RADALT | Nav's RADALT |
|---|---|---|---|---|
| **Day LL** (Note 2) | I-DOP | | X | |
| **Day Threat Penetration** | I-DOP | | X | X |
| **NVG LL** (Note 2) | I-INS | X | X | |
| **NVG Threat Penetration** | I-INS | X | X | X |
| **VMC SCA** | I-DOP (day)/I-INS (Night) | X[3] | X | X |
| **IMC SCA** | GPS FOM-2 | X | X | X |
| **NVG Airland** (Notes 4,5) | I-INS | | X | X |
| **VMC Airdrop** | I-DOP or I-INS or GPS | | | |
| **MCAD Airdrop** | I-INS | X | X | X |

NOTES:
1. Navigator's integrated display computer unit (IDCU) must be operational.
2. Aircraft that do not meet minimum requirements are restricted to MSA.
3. Radar not required for day VMC SCAs
4. Aircraft must be equipped with operational IR landing or IR taxi lights.
5. For blacked-out (AMP-4) operations either the INS-GPS SCNS sub-mode or FLIR must be operational.

# Chapter 16

# ENROUTE AND TERMINAL AREA OPERATIONS

**16.1. General.** This section provides guidance on enroute and terminal area operations. It provides parameters used to employ the techniques and procedures of AFTTP 3-3.HC-130.

***Section 16A—Enroute Operations***

**16.2. Minimum IFR En Route Altitude (T-1).**

16.2.1. Minimum IFR en route altitude is IAW AFI 11-202V3 as supplemented. ***EXCEPTION:*** For contingency operations, compute minimum IFR en route altitude by adding 1,000 feet (2,000 feet in mountainous terrain) above the highest obstruction to flight (man-made obstacle, terrain feature, or spot elevation) within 5 NM of the route centerline. Round this altitude up to the next 100-foot increment. For routes where the terrain varies significantly, a separate minimum IFR en route altitude may be established for route segments with similar terrain or obstacle elevations.

16.2.2. Descent below IFR minimum altitudes, listed above, is only authorized under the following conditions:

16.2.2.1. Intercepting glideslope for an approved IMC SCA, or

16.2.2.2. Reaching the Drop Zone Entry Point for a MCAD.

16.2.2.3. Established on an ATC provided minimum radar vectoring altitude available from a suitably equipped and capable radar facility.

16.2.2.4. Established on a published IFR route or instrument approach procedure compatible with aircraft navigation systems.

16.2.2.5. IMC Descent to VFR.

**16.3. Search Operations.** Conduct search operations IAW AFTTP 3.3-HC-130.

**16.4. Low Level Operations.** Tactical operations conducted below 3,000 feet AGL under VFR are considered low level.

16.4.1. Minimum Equipment Requirements. **See Table 15.3**

16.4.2. Weather Minimums. Modified contour low level operations will be conducted in VMC. ***NOTE*****:** This does not preclude the pilot from the VFR filing requirements in AFI 11-202V3 or applicable ICAO/host nation requirements if operating outside CONUS. ***WARNING*****:** Inadvertent encounters with IMC during VFR operations is an emergency procedure, requiring an immediate climb to a pre-calculated obstacle safe altitude, an appropriate IFF squawk, and a radio call to the area air traffic control agency. During contingency or combat missions, the necessity of flying "comm-out" in IMC, as allowed in SPINs or mission directives, to complete a mission must be evaluated against the increased possibility of controlled flight into terrain (CFIT) and mid-air collision.

16.4.3. Lowest Acceptable Altitude (LAA). During training operations, higher weather or altitude minimums may be dictated by FLIP, ICAO procedures, training considerations or crew experience. Lowest altitudes allowed for enroute modified contour low-level operations are:

16.4.3.1. Day. LAA will be 300 feet modified contour above the terrain (except when using Threat Penetration Altitude), by visual reference to both the terrain and the radar altimeter. Momentary terrain clearance deviations may be expected due to terrain variance.

16.4.3.2. NVG Low-Level. LAA will be 500 feet modified contour above the terrain (except when using Threat Penetration Altitude), by visual reference to both the terrain and the radar altimeter. Momentary terrain clearance deviations may be expected due to terrain variance.

16.4.4. Simulated Emergencies During Low Level Training. Simulated emergencies may be conducted during enroute low-level training on local routes. Aircrew will comply with the following restrictions in addition to those listed in **Chapter 9**.

16.4.4.1. Restricted to flat or rolling terrain

16.4.4.2. Simulated emergencies will only be conducted on specific legs identified during crew brief.

16.4.4.3. Do not compound emergencies.

16.4.4.4. As determined by the instructor pilot, initiate a climb to an intermediate altitude, DFA, or MSA. Continue to climb to or maintain required altitude until the completion of the simulated emergency.

**16.5. Threat Penetration Altitude. (T-1)**

16.5.1. During combat operations limit the time spent at threat penetration altitude to the duration needed to avoid the specific threat.

16.5.2. Threat penetration altitudes may be flown during training operations. The following restrictions apply:

16.5.2.1. A mission IP must be in either seat.

16.5.2.2. Not authorized on unfamiliar routes.

16.5.2.3. Restricted to flat or rolling terrain.

16.5.2.4. No "Break" calls or "Hard Turn" calls may be made. "Turn" calls are allowed. If a turn requires more than 20 degrees angle of bank, the aircraft will terminate threat penetration operations and immediately climb to a normal modified contour profile, MSA, or ESA as required.

16.5.2.5. No simulated emergencies allowed.

16.5.2.6. LAA is 200 for day VMC operations and 300 feet for NVG operations. ***WARNING:*** Bank angles are severely restricted below 200 ft AGL. Due to the close proximity to the ground, aircrews must be cautious of any descending vector that may develop during threat penetration operations.

**16.6. NVG Low Level Specific Requirements. (T-1)**

16.6.1. Lunar Illumination Criteria. There is no minimum illumination requirement to conduct NVG modified contour low level operations. Aircrews will use 0.8 millilux (.00008 lux) effective illumination as a standard for low illumination and increased risk mitigation. This roughly equates to 10% lunar illumination on a clear night. When effective illumination is below 0.8 millilux, crews will obtain squadron CC/DO approval prior to flight, add low illumination as a factor in their risk assessment, and mitigate the risk. This may require changing profile, airspeeds, or altitudes among many other options.

16.6.2. NVG Altitudes and Start Climb Points. The navigator will compute NVG altitudes and start climb points for all NVG low level routes. NVG altitude and start climb points will be annotated on navigator and pilot/copilot charts and briefed in the route study. See AFTTP 3-3.HC-130 for addition information on NVG Altitudes.

16.6.2.1. NVG Altitudes. NVG altitudes are altitudes designed to provide planned modified contour terrain clearance over the planned flight route. Crews will plan NVG altitudes based off of terrain and obstacles 1 NM left and right of route centerline or planned deviation. When a significant tactical advantage (e.g., ridge crossings, flight parallel to ridgeline) can be gained by reducing the NVG altitude basis to 0.5 NM (3,035 feet/1,013 yards) left and right, crews may elect to do so.

16.6.2.2. Start Climb Points. Start Climb Points are predetermined points defined on a chart at a distance-to-go (DTG) where the aircraft should start a climb to a NVG altitude based on an obstacle on its flight-path.

16.6.2.2.1. Start climb points will be computed during mission planning, annotated on all charts, and briefed during route study for all significant climbs (when there is a terrain differential of 1000 feet or greater over 4 nautical miles or less. This is a minimum and rapidly rising terrain must be evaluated for the entire leg). Regardless of planned visibility or illumination, tailwind effects must be considered. Continue to evaluate planned climb schedule during execution. One-engine inoperative performance must be considered.

16.6.2.2.2. Start Climb Point Calculations. Calculate start climb points IAW AFTTP 3-3.HC-130. Climb rate should normally be based on 1,000 feet per minute. Density altitude, aircraft gross weight and tailwinds may require pilots to add distance to their start climb points. ***NOTE:*** Due to errors in DTED, consider using reported DTED accuracy (if available) and applying it to the user-specified buffer altitude when computing NVG altitudes.

16.6.3. Enroute and Objective Area Navigation. Accomplish obstacle avoidance at night using NVGs, radar, SCNS, IDS/FLIR (some airplanes), and radar altimeter along with flying NVG altitudes as necessary to ensure terrain clearance. Higher altitudes up to MSA may be required. ***WARNING*:** Because of the distinct possibility of crewmembers experiencing spatial disorientation during NVG low-level flight or low illumination NVG air refueling, one pilot should be immediately ready to fly the aircraft should the other pilot become disoriented.

16.6.3.1. The primary source for NVG low-level altitude is visual pilotage. Therefore navigators should assume that the aircraft will be at the lowest possible point within the corridor for the intended NVG ground track plan and base start climb points there, not from the last NVG altitude prior to the start climb point. When calculating start climb points in this manner, greater terrain differentials will result, which will place start climb points further away from critical terrain. This conservative approach will result in less aggressive climb profiles, allowing the aircraft to retain a greater amount of energy in mountainous terrain.

16.6.3.2. Pilots will inform the crew any time the aircraft descends below the navigator's NVG altitude, once the controlling terrain is called in sight. ***WARNING*:** If at any time the pilot loses sight of the NVG altitude controlling terrain, the crew will fly the NVG altitudes computed by the navigator.

16.6.3.3. If a higher NVG altitude is based on an obstruction beyond the flying pilot's line of sight, the navigator will direct a climb at the start climb point to the new NVG altitude until such time the obstruction becomes visible to the flying pilot. At this time, a decision to continue the climb or fly below NVG altitude can be made.

**16.7. Low-Level Emergency Procedures. (T-1)** The procedures listed below apply to both training and contingency operations. ***EXCEPTION*:** During combat operations, if a climb to MSA/ESA will expose the aircraft to greater hazard due to enemy threat detection, the aircraft commander may climb to a Detection Free Altitude (DFA) or intermediate altitude during a low level emergency. The decision to use this altitude vice MSA/ESA must be based on a thorough pre-mission assessment of enemy's overall threat detection capability and the nature of the emergency encountered. ***NOTE*:** Climb to MSA when either pilot must leave the seat during low level flight. ***EXCEPTION*:** If performing a planned seat swap for training with an IP in the seat, climb to a safe altitude.

16.7.1. Crew Disorientation. If a crew becomes lost or disoriented on a low-level mission, immediate steps must be taken to regain the planned flight path.

16.7.1.1. Start a climb to ESA. Continue the climb until the ESA is reached or a positive fix obtained. While higher altitude increases the field of vision and reduces the terrain hazard, it may make the airplane more vulnerable. A fix, visual or radar, should be found as soon as possible.

16.7.1.2. After obtaining a positive fix, descend and resume low-level operations. The navigators will crosscheck timing and adjust as necessary.

16.7.2. Pilot Spatial Disorientation or Inoperative NVGs**.** ***WARNING*:** The PM must be ready to immediately take control of the aircraft if the flying pilot experiences spatial disorientation or a malfunction of his/her NVGs.

16.7.2.1. If either pilot experiences spatial disorientation, start a climb to at least MSA. Continue to climb to or maintain at least MSA until the pilot experiencing the problem is ready to assume PM or PF duties. Low-level operations may be continued at the discretion of the PIC.

16.7.2.2. If either pilot's NVGs become inoperative, start a climb to at least MSA. Maintain at or above MSA until the NVG malfunction has been resolved. Low level operations may be continued at the discretion of the PIC.

16.7.3. Inadvertent Weather Penetration. Climb to MSA if unable to avoid flight into weather conditions that prohibit VMC operations. A further climb to ESA may be required. The route may be resumed after VMC is reestablished.

16.7.4. Aircraft System Failure. When a known or suspected malfunction prevents continued safe low level operations, start a climb to at least MSA. Continue to climb to or maintain at least MSA until all troubleshooting and/or required flight manual procedures have been accomplished. If minimum equipment requirements are met IAW **Chapter 4** and **Table 15.3**, low-level operations may be continued at the discretion of the PIC. Aircraft not meeting minimum operating equipment requirements will fly at MSA or higher.

16.7.5. **Emergency Climb Procedure. (T-1)** The decision to execute an emergency climb should be made as soon as possible and should be considered in cases of, but not limited to, certain equipment malfunctions, spatial disorientation, inadvertent weather penetration, loss of situational awareness, and imminent contact with the terrain. Any crew member may initiate an emergency climb by stating "Emergency Climb." See **Table 16.1** for emergency climb procedure. ***WARNING:*** Flight engineers will compute flaps up (High Boost) and 50% flap obstacle clearance speeds for all low levels, prior to departure. During low-level operations, the flight engineer will state "190 knots" when enroute airspeed decays to 190 knots. Flight engineers will further announce to the aircrew in 10 knot increments airspeeds below 190 knots (e.g. "180", "170") until the airspeed exceeds 190 knots. ***EXCEPTION*****:** Not required for planned slowdowns (HAAR, airdrops, INFIL/ EXFIL, etc).

**Table 16.1. Emergency Climb Procedures.**

| |
|---|
| 1. Announce "Emergency Climb" to the crew. |
| 2. Simultaneously set maximum power on all operating engines and close all bleed air valve switches.<br><br>***WARNING:*** Power settings greater than 19,600 pounds of torque may be required to clear an obstacle. Torque settings of 19,600 to 21,500 only require a AFTO form 781A entry and no inspection is required. Aircraft that experience an over-torque over 23,000 inch-pounds are to immediately return the aircraft for inspection and required maintenance.<br><br>***CAUTION:*** Closing the bleed valves will result in depressurizing the aircraft. Use caution in areas of high terrain as cabin altitude may exceed 10,000 feet. The onset of hypoxia symptoms may complicate judgment. |
| 3. Ensure temperature datum control valve switches are in auto unless malfunction prevents compliance). |
| 4. Close ramp and door (if open). |
| 5. For zero flaps (e.g., en route) climb the aircraft at zero flap obstacle clearance speed. For any flap setting (e.g., airdrop, HAAR) set flaps to 50 percent and climb out at 50 percent flap obstacle clearance speed. |
| 6. Turn away (with consideration for stall margin) from terrain if feasible. If not possible, climb straight ahead for the maximum climb angle.<br><br>***WARNING:*** If at flaps up obstacle clearance speed and turning is required, additional flaps may be necessary to avoid an accelerated stall. |

| |
|---|
| ***WARNING:*** To prevent a stall, do not slow below obstacle clearance speed. A low altitude stall has a high probability of resulting in a crash and loss of life.<br><br>***WARNING:*** A wings level climb will result in the maximum angle/rate of climb. Any bank angle during this procedure will result in a lower than possible climb gradient and increases stall speed. |
| 7. The PM will monitor and call airspeed as appropriate. |
| 8. The navigator will state an MSA, monitor terrain (via radar, chart, etc.) and call "Clear of Terrain" when above all critical terrain. If the straight-ahead flight path vector will not ensure terrain clearance, the navigator will state optimum heading. |
| 9. When clear of all terrain, adjust pitch, power, and airspeed for a normal climb out and level off and return all switches to their normal position.<br><br>***WARNING:*** Pilots will ensure sufficient stall margin exists prior to commencing turn.<br><br>***WARNING:*** If impact with terrain is imminent, use 100 percent flaps, gear up, at 10 knots above power off stall speed and land the aircraft straight ahead. |

***Section 16B—Terminal Area Operations***

**16.8. Self-Contained Approach (SCA). (T-1)** SCA procedures may be used for approaches to conventional airfields and assault zones, and for either overt or covert airland operations. SCAs may be conducted using the INFIL/EXFIL Checklist or the normal DESCENT, BEFORE LANDING Checklist.

16.8.1. SCA Restrictions. Comply with local ATC restrictions and host nation agreements, as appropriate.

16.8.2. Weather minimums: SCAs will be conducted in VMC unless the procedure is published for IMC use by National Geospatial-Intelligence Agency (NGA) or approved for IMC use by MAJCOM/A3 IAW AFI 11-202V3.

16.8.2.1. IMC SCA weather minimums will be no lower than 300 ft and 1 SM.

16.8.2.2. For NGA-published SCAs, use published minimums but no lower than 300 foot ceiling and 1 SM visibility.

16.8.3. Minimum Equipment Requirements. See **Table 15.3**

16.8.4. Missed Approach Point (MAP).

16.8.4.1. For VMC SCAs, the MAP will be at zero distance to go on the SCNS at MDA.

16.8.4.2. For IMC SCAs, the missed approach point will be as 1NM or as published, whichever is greater.

16.8.5. Pre-mission Requirements

16.8.5.1. SCA Construction. Construct SCAs IAW AFTTP 3-3.HC-130 and the following:

16.8.5.1.1. Chart scale and construction requirements are IAW **paragraph 15.11**

16.8.5.1.2. The navigator will construct an approach plate for the SCA using the AF IMT Form 4118, **SCA Planning Form**, the approach planning tool (APT) in FalconView, or an OGV-approved planning form.

16.8.5.2. Plan a minimum 7 NM approach unless prohibited by the order of battle. Turning SCAs, dogleg SCAs, etc, will be planned and executed IAW AFTTP 3-3.HC-130. If an SCA is developed for IMC use, it is recommended to plan a minimum of a 10 NM straight in.

16.8.5.3. Minimum Descent Altitude (MDA). To compute MDA, add 300 feet to the Touchdown Zone Elevation (TDZE).

16.8.6. Mandatory SCA calls.

16.8.6.1. At the initial Point, the navigator will make distance calls at every mile inside ten miles and every half mile inside three miles (or as briefed). In addition, he/she will make the following calls during the approach.

16.8.6.1.1. "Begin Descent" to initiate descent on the SCA glidepath. ***WARNING:*** Prior to making this call, the navigator will verify that actual aircraft position is inside the planned SCA obstacle template.

16.8.6.1.2. "100 Above" to announced 100 ft above the MDA.

16.8.6.1.3. "Minimums" announced at the MDA.

16.8.6.2. "Go-around." A go-around will be announced and initiated at the MAP if the LZ has not been visually acquired, a safe landing cannot be accomplished, or if directed.

16.8.6.3. Immediate Landing Feasible. If a go-around occurs and an immediate landing is feasible and desired, the PF will announce intentions and maneuver to a VFR pattern.

16.8.7. **Approach Execution**:

16.8.7.1. General. Each pilot will silently ensure both NVG batteries are operational during the ENROUTE Checklist.

16.8.7.2. Inbound to the LZ. Maintain en route profile until descent to MDA. Initiate slowdown at the point identified during mission planning.

16.8.7.2.1. Pilot Flying. The PF will steer to the LZ using the flight director system or following the navigator's headings.

16.8.7.2.2. Pilot Monitoring. The PM will back up the PF on the instruments/displays and confirm terrain clearance using all means available. The PM and flight engineer will clear for obstacles and other traffic.

16.8.7.2.3. Navigator. The navigator will:

16.8.7.2.3.1. Determine the most accurate altimeter setting for the LZ using all available sources including GPS, weather forecasts, ground station reporting and altitude calibration, as available.

16.8.7.2.3.2. [At the Initial Point] Confirm LZ alignment with radar and/or FLIR/IDS, and give final course headings as required.

16.8.7.2.3.3. Confirm SCNS position using preplanned update points and provide corrections as needed.

16.8.7.2.3.4. Confirm LZ centerline alignment on short final using all available means and correct aircraft alignment if required. ***NOTE:*** The FLIR/IDS is helpful in LZ identification and should be used to scan the LZ for obstructions, but it is not intended to be used to fly the entire SCA.

16.8.8. **Slowdown**.

16.8.8.1. The navigator will initiate the slowdown. Slowdown should be initiated approximately 3 NM prior to the planned glide slope intercept point.

16.8.8.2. The PF will slow the aircraft to no less than 50 percent threshold speed, configure the flaps and gear as airspeed permits, and call for the appropriate checklist (SLOWDOWN/BEFORE LANDING portion of the INFIL/EXFIL checklist or normal BEFORE LANDING checklist). Call for 100 percent flaps as airspeed permits. Ensure 100 percent flaps are set prior to reaching threshold speed. For turning SCAs, maintain 140 KIAS or 50% flap approach speed whichever is higher in the turn.

16.8.8.3. Altimeters. Radar altimeters should remain set at enroute altitude setting until slowdown. Once slowdown is initiated, the radar altimeters may be reset as briefed. The navigator should set 300 feet to guard against shallow glide slopes.

16.8.9. Descent. Upon approaching glide slope intercept the navigator will confirm the accuracy of the barometric altimeter setting by comparing actual AGL and MSL altitudes with those depicted on the SCA template.

16.8.9.1. Glide Slope Intercept. The pilot flying will begin descent upon navigator direction. ***WARNING:*** The PM and navigator must closely monitor radar altimeters to ensure accuracy of altimeter settings to prevent inadvertently flying below planned AGL minimums.

16.8.9.2. At glide slope intercept the navigator will state “Begin Descent” and repeat the desired initial descent rate. The navigator, backed up by the PM, will provide glidepath advisories referenced from navigator‘s pressure and radar altimeters and backed up by SCNS. These calls will be made at ½ NM intervals until reaching the “Minimums” or “100 feet” call. The Navigator will state any deviation in excess of 150 feet explicitly. The navigator also advises the pilot if the aircraft is correcting to or diverging from glidepath and how “Rapidly” as appropriate. As a guide, the following criteria may be used for glideslope deviation calls:

16.8.9.2.1. “Slightly above” or “Slightly Below”..........50 feet

16.8.9.2.2. “Above” or “Below”.....................100 feet

16.8.9.2.3. “Well Above” or “Well Below” .............150 feet

***WARNING*****:** Use of glideslopes greater than 5 degrees can cause descent rates in excess of 1,000 feet per minute. Extreme care must be taken to break high descent rates with application of power prior to touchdown. In no case will a descent below 300 feet AGL be initiated prior to 2 NM to touchdown. This would cause the glideslope to be too shallow.

16.8.10. Transition from Minimum Decision Altitude (MDA) to Landing/Go-Around.

16.8.10.1. Do not descend below MDA until the LZ environment is identified visually and confirmed by both pilots. Whoever identifies the LZ first will call "ZONE IN SIGHT, relative clock position and any discrepancies (i.e., lights out, etc.)". Both pilots will then confirm the zone and cross-check the alignment for the proper heading.

16.8.10.2. Initiate a go-around at the MAP if the LZ environment has not been visually acquired or if the aircraft is not in a position to execute a safe landing. See **paragraph 16.12.6** for go-around and immediate landing feasible.

16.8.11. IMC SCA Procedures. ***NOTE:*** When performing IMC SCAs, at the ACs discretion, the copilot may fly the IMC portion of the SCA and upon transitioning to VMC the PIC will assume control for the VMC portion and landing.

16.8.11.1. A system update and altimeter update are conducted within 10 minutes of starting the IMC SCA.

16.8.11.2. IMC SCA Altitude. At 10 NM or the IP, whichever is closer to the LZ, fly a minimum of 500 feet above the highest obstruction within 2 NM either side of the run-in centerline to the Begin Descent point. The IMC SCA altitude may be segmented.

16.8.11.3. Significant/Critical Obstacles. If a significant or critical obstacle exists within the standard SCA template (see AFTTP 3-3.HC-130) do not descend below 500 feet above the obstacle until the obstacle is positively identified visually or on the radar.

**16.9. FOR FUTURE USE.**

**16.10. NVG Airland Operations (T-1).**

16.10.1. **General.** VMC NVG airland operations will normally be conducted using the INFIL/EXFIL Checklist. SCA procedures will be used to the maximum extent possible. However, other tactical visual approaches may be used if the pilot is appropriately certified, mission/training requirements dictate, and the approach is accomplished IAW airland operations procedures in AFTTP 3-3.HC-130. ***NOTE*:** When using other tactical approaches, the pilot will call "Slowdown Now" initiating the SLOWDOWN/BEFORE LANDING Checklist. Do not descend below 300 feet AGL until the LZ environment is identified visually and confirmed by both pilots. Whoever identifies the LZ first will call out "Zone In Sight", its clock position, and any discrepancies noted (i.e., any lights out, etc.). Both pilots will then confirm the zone and crosscheck the alignment for the proper heading. The navigator/engineer will make standard Infil/Exfil altitude advisory calls on descent. For further, guidance see Section II of the flight manual.

16.10.2. Aircrew Requirements. Pilots and Flight Engineers will be NVG airland qualified; Navigator will be SCA qualified.

16.10.3. Runway and Taxiway Requirements. See **paragraph 5.15** for normal and maximum effort runway/taxiway requirements. See **paragraph 9.7** for minimum runway required for NVG touch and go operations.

16.10.4. **Minimum Equipment Requirements.** See **Table 15.3**

16.10.5. A go-around point will be identified during pre-mission planning for all NVG airland operations.

16.10.6. If the aircraft commander determines there is sufficient illumination, landing lights may remain off during NVG airland operations.

16.10.7. **Blacked-Out (AMP-4) Runway Operations.** Training operations will be conducted IAW the restrictions and requirements of AFI 11-202V3, as supplemented.

16.10.8. **Loss of NVGs.**

16.10.8.1. On final, if either pilot loses use of their NVGs inside 1NM on final, a go-around will be executed. Exceptions for contingency operations will be prebriefed. If either pilot experiences a malfunction of his/her NVGs during an NVG landing, the PM must be able to assume control and execute the appropriate action. The copilot must be ready to turn on overt landing and taxi lights to assist in the maneuver executed.

16.10.8.2. On the ground, the aircraft commander will determine whether to continue the landing rollout or takeoff roll. The copilot must be ready to turn on overt landing and taxi lights to assist in the maneuver executed.

16.10.8.3. After takeoff. Continue the climb-out, transfer aircraft control as required, and follow the appropriate procedures for loss of NVGs (Start a climb to MSA for uncontrolled airfield or follow ATC climb-out if applicable).

**16.11. Tactical Approaches. (T-1)** Aircrews will conduct tactical approaches (Overhead, downwind, random steep, and random shallow) IAW the airland operation procedures found in AFTTP 3-3.HC-130.

16.11.1. NVG Tactical Approaches. Tactical recovery certified pilots may conduct NVG random steep and random shallow approaches to AMP 1, 2, 3 or 4 marked landing zones.

16.11.2. Restrictions.

16.11.2.1. Stall speeds for 45 and 60 degrees of bank (clean) will be checked prior to accomplishing random shallow approaches. ***NOTE*****:** 60-degree bank stall speed is equal to 1.4 times wings level stall speed.

16.11.2.2. When performing tactical approaches, adhere to flight manual maneuvering and configuration restrictions.

**16.12. Infil/Exfil Operations. (T-1)** The INFIL/EXFIL Checklist/procedures are typically used to transition from the low level to place the aircraft on final approach, properly configured, in a position to identify the landing area, complete a landing, conduct a rapid onload or offload (if required), and quickly return to low level flying.

16.12.1. General. The INFIL/EXFIL Checklist is used during tactical operations and replaces the normal DESCENT, BEFORE AND AFTER LANDING, BEFORE TAKEOFF, LINE UP, and AFTER TAKEOFF Checklists from appropriate flight manual. The checklist can be used for day or NVG operations and to make overt and covert/blacked-out landings.

16.12.2. Aircraft Preparation.

16.12.2.1. Chemical lights. Attach chemical lights to each emergency exit handle with tape in such a way as to allow a small amount of light to shine through. ***WARNING*****:** Chemical lights attached to exit doors and emergency escape hatch handles will remain in place until mission completion.

16.12.3. Loadmaster (LM) Requirements**.**

16.12.3.1. Loadmaster Infiltration/Exfiltration Guide. Loadmasters will use the AFTTP 3-3.HC-130, Attachment 10, *Loadmaster Infiltration/Exfiltration Guide* to amplify flight manual procedures and guidance found in this instruction.

16.12.3.2. LMs will wear NVGs during blacked-out operations.

16.12.3.3. LMs will wear NVGs on aircraft with NVG-compatible lighting; however, they may be raised when NVG lighting is illuminated.

16.12.4. Approach to LZ.

16.12.4.1. Radar Altimeters. Radar altimeters will remain set at en route altitude setting until the slowdown. Once the slowdown is initiated, the radar altimeters may be reset IAW the flight manual.

16.12.4.2. Flap Settings. Ensure 100 percent flaps are set prior to reaching threshold speed (If 100 percent flap setting used).

16.12.5. Descent. Do not descend below 300 feet AGL until the LZ environment is identified visually and confirmed by both pilots. ***WARNING*****:** In no case will a descent below 300 feet AGL be initiated prior to 2 NM to touchdown. This would cause the glideslope to be too shallow.

16.12.5.1. Landing lights. Depending on aircraft configuration, flight engineer or copilot will extend/turn on the IR or overt landing and taxi lights. At the discretion of the aircraft commander, landing lights may be extended when the Landing Light Panel call is made during the SLOWDOWN/BEFORE LANDING Checklist but left off until the navigator's "200" foot call.

16.12.5.2. The navigator will call 100, 50, 25 and 10 feet above touchdown.

16.12.6. Go-Around and Departure Procedures. When executing a go-around or departure, the navigator will call out passing 100, 200, and 300 feet AGL. Whether maneuvering for another approach or proceeding with the route, plan to fly no lower than enroute LAA unless operational requirements dictate other altitudes. During a go-around initiate the GO AROUND Checklist. ***CAUTION*****:** Pilots are more susceptible to spatial disorientation during NVG go-arounds and departures.

16.12.6.1. Immediate Landing Feasible. If an immediate visual approach and landing (closed pattern) are feasible, exercise caution in clearing for obstacles. Maneuver the aircraft to be 500 feet AGL wings level and configured at approximately a 2 NM final. Care must be taken to keep the landing zone insight during this maneuver.

16.12.6.2. Immediate Landing Not Feasible. If an immediate approach and landing are not feasible, maneuver the aircraft to the IP or next waypoint at or above enroute LAA unless operational requirements dictate other altitudes. Continue with the alternate plan. With an immediate landing not feasible, execute the AFTER TAKEOFF Checklist after the completion of the GO AROUND Checklist.

16.12.7. Ground Operations.

16.12.7.1. See **paragraph 5.29.3** for rapid Infil/Exfil ground procedures. Also see AFTTP 3-3.HC-130 for amplifying guidance.

16.12.7.2. The ON THE RUNWAY Checklist is automatically initiated when the pilot clears the ramp and door. During the initial Infil/Exfil brief, the pilot may pre-brief the opening of the ramp and door upon reversing of the engines. Opening of the ramp and door initiates the ON THE RUNWAY Checklist.

16.12.8. Overt Landings Following NVG Landings. If the sortie will continue with Non-NVG VFR traffic patterns, the COMBAT EXIT and the TOUCH AND GO LANDING Checklist or the INFIL/EXFIL OPTION LANDING Checklist will be accomplished. If only a few patterns are planned, the INFIL/EXFIL OPTION LANDING Checklist is quicker and easier to use. If many patterns or instrument work is planned, the COMBAT EXIT and TOUCH AND GO LANDING Checklist are appropriate.

16.12.9. Infil/Exfil Option Landing Procedures. Fly the pattern to be wings level on 1 NM final. Pilots will call the zone in sight as they turn final and navigator/engineer will make standard altitude advisory calls on descent. For further, guidance see Section II of the flight manual.

# Chapter 17

## AIRDROP OPERATIONS

**17.1. Airdrop General.** This section provides guidance for HC-130 airdrop operations. It provides parameters used to employ the techniques and procedures of AFTTP 3-3.HC-130.

**17.2. Airdrop Kits.** The loadmaster will ensure enough equipment is included to satisfy load or mission requirements. Minimum contents of airdrop kits will include cloth-backed pressure sensitive tape, masking tape, 1/2-inch tubular nylon cord, 550 cord, 5 cord, 80-pound cotton webbing, two G-14 clevises, and adjustable wrench.

**17.3. Verification of Load Information.** The navigator will verify the actual number and type of parachutes, load weights, sequence of delivery, and position of loads in the aircraft agree with planned CARP data. Recalculate CARPs when required. If an individual load has a different type or number of parachutes from other loads, compute a CARP for each load to ensure all loads will land on the DZ. Base drop altitude on the item requiring the highest drop altitude.

**17.4. Marking Airdrop Loads.** The navigator will mark call sign and date on all equipment, containers, and standard airdrop training bundles (SATBs). Mark equipment loads by order of exit if more than one load is dropped on the same pass. ***EXCEPTION***: If more than one CDS bundle is dropped on the same pass, mark only the first container out.

**17.5. Airdrop Altitudes and Airspeeds.** See AFI 11-231, *Computer Air Release Point Procedures*, for specific airdrop altitudes and airspeeds.

17.5.1. Except for parabundle, MA-1 kits, free fall, and LCLA equipment airdrops, the primary altitude reference should be the planned MSL drop altitude based on the most accurate altimeter setting available. It is critical to cross-check the radar altimeter against the MSL altitude during the run-in.

17.5.2. The aircraft must be level at drop altitude and on drop airspeed by green light time. Slowdown during personnel drops should be planned to allow jumpmaster access to paratroop doors NLT 1-minute before TOT (2-minutes for jumpmaster directed drops).

**17.6. Drop Zone Types and Minimum Drop Zones Size.** Refer to AFI 13-217.

**17.7. Drop Zone Markings.** Plan and coordinate DZ markings according to AFI 13-217.

**17.8. Airdrop Weather Minimums and Wind Restrictions.** Comply with published AFI 11-202V3 and FLIP VFR weather minimums for visual airdrops. For non-CONUS VFR airdrops, comply with host nation VFR criteria if more restrictive than AFI 11-202V3.

**17.9. Airdrop wind limitations.** Refer to AFI 13-217.

**17.10. Minimum Aircraft Equipment Required for Airdrop Operations.** See **Table 15.3**

**17.11. Airdrop Communications Procedures.** IAW AFI 13-217. For training operations, radio silence procedures will be coordinated prior to mission execution.

**17.12. Airdrop Checklists.** Amplified tactical checklists are located in **Attachment 2**. Amplified search and rescue checklist are located in **Attachment 3**. Abbreviated checklists are AFI 11-2HC-130V3, CL-1 and CL-2. Checklists may be compressed or completed early if mission requirements dictate. Normally, all items of the preceding checklist are to be accomplished prior to initiating the next checklist. Avoid the use of the word "Green" or "light" after initiation of the SLOWDOWN checklist until arriving at the release point.

**17.13. Airdrop Restrictions.**

17.13.1. Joint Airdrop Inspection Records**.** Unless exempted by AFJI 13-210, *Joint Airdrop Inspection Records, Malfunction Investigations, and Activity Reporting*, MAJCOM supplements or waivers, a DD Form 1748, **Joint Airdrop Inspection Record**, will be accomplished prior to all equipment airdrops. Completion, retention, and disposition of the form(s) will be in accordance with AFJI 13-210, as supplemented. A-7A and A-21 containers rigged as door bundles do not require inspections. ***NOTE*****:** Equipment not rigged IAW 13C-series TOs, Army Field Manuals, or Joint Special Operations Command (JSOC) 350-series manuals require a waiver from U.S. Army Quartermaster, Ft Lee, VA. Channel waiver requests through HQ ACC/A3TV. ***EXCEPTION*****:** Waivers are not required for resupply, parabundles, and equipment described in this volume.

17.13.2. Drop Zone Surveys. The pilot and navigator will review the DZ survey during mission planning (T-1). ***CAUTION*****:** Airdrops at high-elevation drop zones (those above 5,000 feet in density altitude) create a greater risk for personnel injury due to higher opening shock and increased rates of descent, especially during static line personnel airdrops. A thorough risk assessment must be made before such operations since injury rates of up to four times those expected for similar DZ operations near sea level can occur under these conditions.

17.13.3. Airdrops will be conducted with a minimum of 1 minute separation. (T-1)

17.13.4. Minimum En Route Flight Time. Minimum en route flight time from takeoff to time over release point, for drops, will be sufficient to safely accomplish all required checklists. For airdrops involving personnel, en route time of less than 25 minutes must be approved by the jumpmaster.

17.13.5. Ballistic Requirements. Crews will not make airdrops using parachutes for which AFI 11-231 does not list ballistics unless the user provides approved ballistic data or K factor. HQ ACC/A3J, Aeronautical Systems Division or US Army Soldier's System Center Natick (ASD/ENFC), will approve the ballistics or K factor. This does not apply to formal test missions where the purpose of the test is to derive ballistic data for a specific load. (T-1)

17.13.6. Aircraft Configuration**.**

17.13.6.1. The SCNS Airdrop/Troop Jump Computer-Manual Select Switch will be set to AD/TJ manual for all airdrop operations.

17.13.6.2. The aircraft will not be configured where the cargo ramp and door and the paratroop door(s) are open at the same time. (T-1) ***EXCEPTION:*** Authorized loadmaster-directed airdrops of bundles off the ramp, to include trial-line drops, while spotting from a single open paratroop door IAW **paragraph 17.36**

17.13.6.3. If an air deflector door cannot be opened, its respective paratroop door will not be used. (T-1)

17.13.6.4. If the aircraft is configured with an operational static line retriever, static line personnel drops are authorized. ***WARNING*****:** Parachutists using static line deployed parachutes will not jump from airplanes without an operational static line retriever.

17.13.6.5. A maximum of ten static lines may be retrieved manually per paratroop door. A maximum of 20 static lines per cable may be retrieved with a static line retriever winch.

**17.14. Safety Devices. (T-1)** Loadmasters will wear a restraint harness/parachute, helmet, and eye protection when performing duties near an open exit in flight. Helmet and eye protection will be worn IAW **Chapter 6**. Fit the restraint harness and adjust the lifeline prior to flight.

17.14.1. Connect and adjust the lifeline to a floor tie-down ring that will preclude the wearer from exiting the aircraft.

17.14.2. Restraint harness lifelines may be attached to an unused anchor cable provided no static lines are attached and an anchor cable stop is positioned and taped at FS 737. The center anchor cable support may be used in lieu of the stop if lowered. Do not use this configuration(s) if both paratroop doors are open at the same time. Instead, connect and adjust the lifeline to a floor tie-down ring that would preclude the wearer from exiting either exit.

17.14.3. As required, disconnect the hook, roll and secure the lifeline to the restraint harness after the lifeline has been adjusted.

17.14.4. Connect the lifeline when at, or anticipating movement aft of, FS 677.

17.14.5. If using the personnel restraint system (shuttle system), connect to the side opposite the paratroop door used for airdrop. If both paratroop doors are to be opened, connect to both sides. For ramp and door airdrops, move the shuttle aft of the A-frame after the ramp and door are in the ADS position. Move shuttle forward of the A-frame and pin before closing the ramp and door.

17.14.6. The onboard safety personnel will normally provide their own parachute. Alternately, at their discretion, they may use a restraint harness. Other personnel required to be mobile in the cargo compartment, as determined by the aircraft commander, will be provided a restraint harness. ***EXCEPTION*****:** Flight examiner loadmasters are exempted from this requirement provided they are not performing primary or backup loadmaster duties and will not be moving aft of FS 677. If either of these conditions is not met, a restraint harness is required. ***NOTE*****:** Do not use the flight deck restraint harness for airdrops. ***NOTE*****:** For actual combat missions, wear a restraint harness for drops below 1000 feet AGL. For drops at or above 1000 feet AGL, parachute wear is recommended.

**17.15. Methods of Aerial Delivery. (T-1)** The following are approved methods of aerial delivery:

17.15.1. Computed Air Release Point (CARP) Aerial Delivery. This a visual airdrop. The computed air release point (CARP) is a mathematical computation based on average parachute ballistics and dead reckoning principles. After computing the CARP solution, the navigator plots it on an appropriately scaled chart, sketch, diagram, or aerial photograph. Detailed instructions for CARP computations and depictions are contained in AFI 11-231. ***NOTE*****:** Accurate visual positioning of the aircraft over the release point is the major difficulty of the CARP system. Make corrections to the aircraft track as far out from the CARP as possible to minimize this deficiency. To achieve desired drop accuracy, maintain the track during the final approach to the CARP and throughout the drop (green light) time.

17.15.2. Pilot/Loadmaster directed airdrops. Pilot and loadmasters may direct certain specialized rescue equipment and free fall equipment deliveries IAW **paragraphs 17.36 and 17.37**

17.15.3. Ground Marked Release System (GMRS). Airdrops may be made using the visual ground marked release system (GMRS). In this system, supported ground forces are responsible for computing a release point and providing ground markings (panels or lights). The airdrop will be made directly over this marker or abeam a flank marker as determined during joint planning. Aircrew procedures are the same as those employed during a standard drop except that a pilot may assume the responsibility for calling "5 Seconds" and "Green Light." The navigator will compute an in-flight CARP to predict the approximate location of the release point and facilitate initial line-up during the run-in to the DZ. See AFI 13-217 for markings. ***NOTE*:** The user assumes responsibility for airdrop accuracy during GMRS drops.

17.15.4. Verbally Initiated Release System (VIRS). VIRS is an airdrop method by which ground personnel provide verbal steering guidance to an aircraft and call the release when the aircraft arrives over a predetermined point on the ground. VIRS will only be performed by qualified and properly trained personnel IAW AFI 13-217. When this option is selected:

17.15.4.1. The ground party will compute the release point.

17.15.4.2. The ground party will position on the intended release point, provide the aircrew with verbal steering guidance and call the release when the aircraft reaches the release point.

17.15.4.3. The ground party should use the terminology in **Table 17.1**

17.15.4.4. The authentication procedures to be employed will be briefed prior to the mission. The procedure should be as simple and short as possible so as not to interfere with the approach to the DZ. Based on the limitations of radio equipment and terrain, a point will be identified as far out on the approach as possible where contact should be first attempted for authentication.

17.15.4.5. The ground party must maintain positive visual contact with the aircraft at all times during the inbound approach. If, in a training situation, doubt exists that the airdrop can be safely executed, or if the DZ cannot be positively identified by the aircrew, a no drop will be called by either the ground party or the aircrew.

**Table 17.1. Standard Ground Party Voice Terminology for VIRS.**

| Jumpmaster Calls | Explanation |
|---|---|
| “Turn Left” or “Right” | Directs approximately a half standard rate turn unless specified otherwise. |
| “Stop Turn” | Self-explanatory |
| “Standby” [Note 1] | Indicates approximately five seconds prior to the release point |

| | |
|---|---|
| “Execute, Execute, Execute” [Note 2] | Directs release of the load |
| ***NOTES:*** (1) Upon hearing the term "Standby", the navigator will state "5 Seconds" on the interphone. (2) On the first "Execute," the navigator will state "Green Light." | |

17.15.5. Jumpmaster Directed (JMD) Airdrops. JMD airdrops require OG/CC or higher approval. ***EXCEPTION*****:** Unilateral PJ airdrops for continuation training. These drops may be performed by qualified AF or sister service jumpmasters (or trainees under the supervision of qualified personnel), may direct the aircraft to a release point and determine the exit point in accordance with the following restrictions and procedures:

17.15.5.1. JMD airdrops will be conducted using the SEARCH AND RESCUE Checklists.

17.15.5.2. Airdrop personnel in VMC only. ***NOTE*****:** For JMD airdrops of pararescue personnel and ATV/RAMZ packages, crews will use SEARCH AND RESCUE DEPLOYMENT Checklists and either a Fixed, Moving, or Crosswind Target Pattern for deployment.

17.15.5.3. The jumpmaster’s parent service/user accepts all responsibility for the accuracy of the drop, plus any potential injuries/damage to equipment.

17.15.5.4. In-flight visual signals, verbal signals, and interphone procedures between the jumpmaster, loadmaster, and pilot will be coordinated prior to takeoff.

17.15.5.5. HALO and HAHO operations may be conducted using JMD procedures.

17.15.5.6. Personnel will not exit the aircraft unless the green light is illuminated.

17.15.5.7. The navigators will still calculate a CARP or HARP for each drop to back up the computations and in-flight directions given by the jumpmaster. Prior to flight, the aircrew and the jumpmaster will compare predicted release points, resolve any significant differences, and agree to a planned slowdown point or time. Navigators will update the jumpmaster in-flight on actual wind information and any changes to the crew’s preflight CARP/HARP location.

17.15.5.8. Standard Voice Terminology. When the jumpmaster provides assistance on final approach, use the standard voice terminology in **Table 17.2**

**Table 17.2. Standard Voice Terminology for JMD.**

| Jumpmaster Calls | Explanation |
|---|---|
| "Steady" | Present course is satisfactory |

| | |
|---|---|
| "Right" | Change direction to the right 5 degrees |
| “Left” | Change direction to the left 5 degrees |
| “Right or Left __ Degrees” | Change direction as indicated). This direction will be utilized when directional changes in excess of 5 degrees are desired. |
| "No Drop" | No Drop will be called for unsafe or unknown conditions or unsatisfactory positioning over the target |
| "Load Clear" | Jumpers or cargo bundles have cleared the aircraft and the pilot is clear to make a turn to begin the next pass and/or observe results of the drop just accomplished |

17.15.5.8.1. Hand Signals. The jumpmaster may use the following hand signals to relay course corrections through the safety man: Thumb left/right, indicating 5-degree correction; and palm open, fingers pointed toward the cockpit, indicating steady.

17.15.5.9. Deployment Procedures.

17.15.5.9.1. No less than 2 minutes out from the release point, the loadmaster will allow the jumpmaster access to the door to begin the spotting procedures. Jumpmaster duties can be performed from any position in either paratroop door or the ramp and door; however, it is recommended that the jumpmaster use the right door for right-hand patterns and the left door for left-hand patterns. The jumpmaster, when wearing a parachute, will connect the static line to the anchor cable designated for use. When wearing an adjusted restraint harness, the jumpmaster will connect to the personnel restraint system or to a tie-down ring that would preclude the wearer from exiting the aircraft. The jumpmaster visually relays steering signals to the loadmaster, who verbally relays this information to the pilot. ***WARNING:*** The paratroop(s) door and the cargo ramp and door will not be opened at the same time. ***EXCEPTION:*** Authorized loadmaster-directed airdrops of bundles off the ramp, to include trial-line drops, while spotting from a single open paratroop door IAW **paragraph 17.36**

17.15.5.9.2. The pilot will make a "Crew, One-Minute Warning" call, at which time the loadmaster/jumpmaster will announce "Safety Checks Complete." The loadmaster is responsible for accomplishing all other appropriate checklists, overall safety in the cargo compartment, monitoring static lines, etc.

17.15.5.9.3. Once safety checks are complete, and the pilot determines that all conditions are favorable for deployment upon reaching the planned/desired exit point, the pilot states "Clear To Jump" and the PM will turn on the green light. Jumpers will exit the aircraft upon reaching the jumpmasters identified release point. ***NOTE*:** The aircrew may turn on the green light once the drop zone has been positively identified, but no earlier than 1 minute prior to the navigators release point for free fall operations, or 30 seconds for static line operations. If at any time exit of jumpers becomes unsafe (aircraft emergency or similar circumstances), the aircrew will turn on the red light and the loadmaster will direct the jumpmaster to stop remaining parachutists.

17.15.5.10. After all jumpers have exited; the loadmaster will call “Load Clear”. At this point the PM will turn on the red light.

17.15.5.11. Mixed Procedures. JMD releases will not be mixed with any other type of airdrop method. When JMD drop procedures are used, the crew will follow the jumpmaster’s instructions, while adhering to normal safety concerns.

17.15.6. **Joint Precision Airdrop System (JPADS).**

17.15.6.1. Guided and Improved airdrop operations are conducted using the JPADS Mission Support Equipment (MSE), UHF Dropsonde Receiver Subsystem (UHF-DRS), GPS Retransmit System (GPS-RTS), JPADS mission planning laptop and software.

17.15.6.1.1. Guided operations are conducted using steerable chutes with Autonomous Guidance Units (AGUs).

17.15.6.1.2. Improved operations are conventional ballistic airdrops (e.g. I-CDS/I-CRL) with non-steerable chutes using the JPADS MSE, mission planning laptop, software and dropsondes (as required) to calculate an improved CARP.

17.15.6.2. Collateral Damage Assessment (CDA): Units must perform a full CDA prior to all JPADS Guided and Improved airdrops. See AFI 13-217 for requirements.

17.15.6.3. The PADS operator (PO) or mission planner is required to provide JPADS mission planning laptop derived CARP(s) for each airdrop pass and a completed CDA prior to airdrop mission execution. Both pilots will review preflight CARP(s) and CDA for each respective airdrop.

17.15.6.4. Dropsondes are not required for drops, however if they are not used a current Air Force Weather Agency (AFWA) 4-D wind model should be loaded in the mission planner.

17.15.6.5. AFWA 4-D weather model should be uploaded into JPADS mission planning laptop and checked by the PO/mission planner before proceeding to the aircraft.

17.15.6.6. Rigging. If dropping two or more bundles rigged for Guided deployment, intermediate gates made of type VIII nylon will be rigged on all CDS bundles and will be manually cut. Intermediate gates are used to ensure a 3-second separation between bundles. Multiple bundles will be secured for forward restraint against a buffer stop assembly or alternate forward barrier. Multiple CRL bundles will be cut individually when directed by the navigator.

17.15.6.6.1. For single stick Guided drops, all intermediate gates will be manually cut by the loadmaster.

17.15.6.6.2. Double stick Guided drops are not authorized.

17.15.6.7. Guided/Improved Airdrop Limitations and Restrictions.

17.15.6.7.1. Wind Limits. Wind limitations are unrestricted for dropsonde operations, 18 knots for JPADS 2K/10K and as published in AFI 13-217 for all other parachutes.

17.15.6.7.2. DZ Size. DZ size criteria for Guided and Improved drops during contingency operations is at the discretion of the user. AFI 13-217 DZ size restrictions apply during training.

17.15.6.7.3. Guidance Footprint Locations. During training operations a DZ, CARP, chute failure footprint and guidance failure footprint will be located within a restricted airspace and on military owned property. If winds force the CARP outside of restricted airspace additional coordination with ATC is required prior to airdrop operations. This includes coordination with the ATC agency, filing a Notices to Airmen (NOTAM), and ensuring airspace is clear for the entire guided system's flight profile from the drop altitude to the ground. [See AFI 13-217]

17.15.6.7.4. During training operations the entire 1-sigma (63%) Improved success footprint will be located within the surveyed DZ boundaries.

17.15.6.7.5. For Guided deployments, recommended drop altitude is no lower than 6000 feet AGL. Packages deployed at lower altitudes do not have sufficient altitude to correct for any errors in the deployment. The additional altitude allows the package to correct for slow exit rolls, changes in wind over the drop area etc. The lowest a parafoil system may be deployed is 3500 AGL.

17.15.6.7.6. IMC/VMC day/night drops are authorized for contingency operations. CONUS training operations are required to comply with FAR 105 restrictions. Drops conducted thru or originating from IMC are only authorized from within or above an active restricted area. Before conducting IMC drops, check with the controlling agency for additional local restrictions. ***CAUTION:*** Guided parachutes systems will not be dropped through severe turbulence or severe icing.

17.15.6.8. Aircrew Procedure.

17.15.6.8.1. JPADS AGU MILGPS Procedure. For training missions with Air Force JPADS AGUs, aircrew will check out the MILGPS from the tactics office. Upon mission completion and prior to removing the MILGPS enclosure, power up the AGU and accomplish the Recovery Mission Duration Zeroization (RMDZ) function. Zeroize prior to removal by pushing, for three seconds, the zeroize button located on the front panel of the MILGPS enclosure. NOTE: Keying and unkeying requires the MILGPS to be installed in a powered ON AGU. The AGU LCD screen should update within 20 seconds and should read MILGPS Keyed or Unkeyed. Once complete power OFF the AGU. The PO will remove and return the enclosure to the Unit's Tactics Office.

17.15.6.8.2. Jettison of JPADS AGU with MILGPS. Instances of jettison, unauthorized access, tampering, theft, or loss of the JPADS MILGPS enclosure must be reported to the GPS Controlling Authority (CA). Each report shall include the JPADS MILGPS serial number and Selective Availability Anti-Spoofing Module (SAASM) GPS serial number of the missing item and must state whether the system was keyed or unkeyed. US Army Product Manager Force Sustainment Systems (PM

FSS) will relay such jettison to the GPS CA. ***NOTE***: Time permitting; the LM with concurrence from the PO will remove the MILGPS enclosure from the AGU prior to load jettison. (T-1)

17.15.6.8.3. After the JPADS mission planning computer produces a CARP, the navigator will entered it into the SCNS. The PM or AMSS will verify the CARP and all airdrop parameters are entered correctly into the navigation system.

17.15.6.8.4. Combination Drops. The limiting factor for combination airdrops is the jumper. When computing the release point, the navigators should use 75% of the maximum personnel glide distance to ensure all personnel could reach the drop zone. Typically parafoil systems have a greater glide distance and should easily make the drop zone during combination airdrops using the more restrictive personnel release point.

17.15.6.8.5. Dropsonde airdrops will be conducted using zero percent flaps, between 170 and 180 KIAS, using only the cargo door. This configuration will prevent the dropsonde from striking the tail of the aircraft. Loadmasters will open the cargo door from the aft control panel for dropsonde airdrops. Loadmasters will release the dropsonde from the corner of the cargo ramp, which will be in the fully closed position. Upon hearing and seeing “Green Light”, release the dropsonde at a 45-degree angle away from the corner of the ramp.

17.15.6.8.6. During training for Improved deployments, a GPS Figure of Merit (FOM) of 3 or less is required. ***EXCEPTION:*** MCAD certified navigators may verify system accuracy using offset aimpoints if GPS FOM is greater than 3.

17.15.6.8.7. For Guided operations, a GPS Figure of Merit (FOM) 3 or less is required from the 1 minute warning until “Green Light”. A “No Drop” will be called if these conditions are not met.

17.15.6.8.8. The AGU should be set to "AUTOLAND" and verified prior to all deployments. The packages will not flare during landing unless the AGU is set to the “AUTOLAND” position. ***EXCEPTION:*** For combination, AGUs will be set as required to meet jumpers mission requirements.

17.15.7. Mission Computer Airdrops. Certified crews are authorized to make airdrops using MCAD procedures in VMC or IMC. See AFTTP 3-3.HC-130 for additional information.

17.15.7.1. Navigators will use a minimum of two (2) Offset Aim Points (OAPs) on the run-in (IP to 1-Minute warning) to verify SCNS course. OAPs should be determined during mission planning and located no more than 6 miles/no less than 1 mile off course centerline. Run-in OAPs will be briefed during the tactical mission brief.

17.15.7.2. Minimum drop altitude for VMC operations is IAW AFI 11-231. Minimum IFR drop 500 feet above the highest obstruction to flight (man-made obstruction, terrain feature, or spot elevation), or 400 feet plus one contour interval above the highest depicted terrain contour, whichever is highest, within 3 nautical miles either side of the run-in centerline from DZ entry point to DZ exit point or as specified in AFI 11-231, whichever is higher.

17.15.7.3. Chart Annotations. When IFR corridor procedures are used, the DZ Entry point, DZ Exit Point, and Instrument Meteorological Conditions Stabilization Point will be annotated on charts at the required distance to go on the run in. The start climb point required to meet DZ Exit Point altitude requirements will be annotated at the required distance to go where the start climb is to be initiated.

17.15.7.4. Aircrew Procedures.

17.15.7.4.1. During the TWENTY MINUTE Checklist 'DZ Data' call, the navigator and the PM will confirm OAP and DZ information in SCNS using SCNS/OAP Card depicted at **Figure 17.1** [items asterisked will be confirmed]. ***NOTE:*** Units may use locally developed cards as long as all the information from **Figure 17.1** is replicated. Locally approved cards will be approved by the OG/CC.

17.15.7.4.2. The PM will inform the pilot flying when 1,000 ft and 100 ft above segmented IFR corridor altitudes and/or IFR drop altitude.

17.15.7.4.3. Initiate descent from minimum IFR altitude at the DZ Entry Point. IFR drop altitude. When operating under Federal Aviation Administration exemption 4371C, the DZ entry point is a maximum of 40 NM prior to the DZ exit point.

17.15.7.4.4. The IFR corridor [DZ entry point to DZ Exit Point] may be segmented IAW with AFTTP 3-3.HC-130 guidance.

17.15.7.4.5. Calculate the DZ exit point based upon three-engine performance at airdrop gross weight. This point will be planned no less than 4 NMs track distance beyond the DZ trailing edge

17.15.7.4.6. Run-in course update procedures using OAPs and the APN-241 Radar are IAW T.O. 1C-130-1-4.

17.15.7.5. Aircrew Procedure IP Inbound.

17.15.7.5.1. After the initial point (IP), the navigator should inform the pilot when they are “cleared to chase” the bar, based on the accuracy of their SCNS solution. The pilot is then cleared to maintain SCNS centerline. Centerline or “on the bar” is considered within 25 yards of SCNS crosstrack (XTRK).

17.15.7.5.2. A cadence should also begin at this time, which should include the following items: cross track (XTRK), Trend or track angle error (TKE), Drift (based on pilot preference), and advisory calls (Time/distance to next event). The cadence should be continuous from the IP through the escape every 15 to 30 seconds based on how well the PF is maintaining centerline.

17.15.7.5.3. Throughout the run-in the navigator should inform the pilot when they are updating SCNS position via a “hot” cursor, switching targets, or updating the ballistic winds. Updating the ballistic winds should be done no later than the 1-minute warning to avoid large course corrections close to the drop zone.

17.15.7.5.4. DZ Acquisition. If the pilots can see visual ground references and DZ markings are used, both pilots and navigator will confirm the DZ in sight prior to the "5 seconds" call.

17.15.7.5.5. Safety Box. If the pilots can see visual ground references the visual “safety box” is primary. If the PM cannot see the ground or identify the visual “safety box” use prebriefed SCNS XTRK and safe parameters.

**Figure 17.1. SCNS/OAP Card.**

| | | | | |
|---|---|---|---|---|
| SCNS PROGRAMMING | | | | |
| DZ NAME: | | DZ WYPT: | TYPE DROP: | |
| DZ INFO (1-2) | | DZ INFO (2-2) | AIRDROP (2-3) | |
| *USABLE DZ | *MAG CRS | *ROF | *DROP REF S/V/**R** | |
| *PI ELEV | *DIST TO SD | *VD | *ALT GATE OFF/**ON** | |
| *TRUE ALT | *SD DIST | *TFC | *WIND TYPE ALT/BAL | |
| *TURN DEL 60 SEC | | *FTT | *DZ COORDINATES N/S W/E | |
| OAPS | | | | |
| REF PT ID | REF PT # | REF PT DES (road T/Cliff/etc) | COORDINATES | ELEV |
| *OAP 1 | | | N/S W/E | |
| *OAP 2 | | | N/S W/E | |
| *OAP 3 | | | N/S W/E | |
| *OAP 4 | | | N/S W/E | |
| *OAP 5 | | | N/S W/E | |

**17.16. Navigating to the Release Point. (T-1)** The following procedures below are based on using tactical airdrop checklist using a navigator directed CARP/HARP delivery method. Release point procedures will differ if using VIRS, GMRS, or JMD delivery methods or SEARCH AND RESCUE DEPLOYMENT Checklist procedures. For additional guidance on High Altitude Airdrops see **paragraphs 17.26 and 17.27**

17.16.1. Planning. Beginning with the DZ, memorize PI location, DZ dimensions, 5 second warning, and prominent DZ features. Plan at least two (preferably three) update points for the run-in to ensure proper DZ alignment. The crew will determine if a level, ascending or descending slowdown is appropriate for the planned run-in.

17.16.2. The navigator performing the airdrop will prepare an AF IMT Form 4123, **Airdrop Card**, or OGV-approved equivalent, for each type drop planned

17.16.3. Pilot and Navigator Release Point Procedures. The navigator and pilot will position the aircraft upwind to the release point using all available means to include but not limited to SCNS and visual techniques and the following pilot/navigator procedures:

17.16.3.1. Airspeed adjustments should be completed prior to the IP or slowdown, whichever occurs first.

17.16.3.2. If the IP is visible from a distance and time control permits, overfly the IP on run-in heading. Otherwise, fly a radius of turn leg to the DZ. If required, update navigation equipment at the IP.

17.16.3.3. After departing the IP, the PM the aircraft assists the navigator in maintaining the desired track inbound by confirming aircraft position with the planned run-in update points. The pilot flying the aircraft will fly SCNS inbound to the release point or will position the aircraft upwind using visual techniques.

17.16.3.4. The navigator will use the SCNS (for MCAD) to position the aircraft upwind to the release point. The navigator provides headings that will position the aircraft the required distance upwind from centerline track so that large corrections will not be required on the final approach to the release point.

17.16.3.5. At slowdown, immediately double the drift used prior to slowdown and apply it to the run-in heading. This will keep the aircraft on the upwind side of the PI.

17.16.3.6. The navigator informs the pilot of the expected drift, the heading required to parallel the DZ axis, and confirms the drop altitude and airspeed. The navigator will update the CARP manually and will update the SCNS (as required) for mission computer airdrops (MCAD). A visual airdrop is defined as the pilot holding an offset and the navigator calling the drop off the PI using the site angle technique or using a timing point.

17.16.3.7. As soon as the DZ is visible and identified by the pilot and navigator, they jointly confirm the release point location, lateral offset, and track required. The pilot then assumes the responsibility for maintaining this offset distance and required track. The navigator will pick the timing point, if required, and control the time of "Green Light" and "Red Light," and continually cross check the offset distance. ***NOTE*****:** Both pilots and navigator will confirm the DZ in sight prior to the "5 Seconds" call.

17.16.3.8. During the final seconds of the approach to the release point, the PM the aircraft places a hand near the jump light switch. Five seconds prior to release, the navigator will give a preparatory call of "5 Seconds." At this call, if the aircraft location is not within precoordinated parameters, a "No Drop" condition exists. (T-1)

17.16.3.9. At the release point: The navigator will state "Green Light". The PM the aircraft will turn on the green light and verbally calls the light "On."

17.16.3.10. During the drop:

17.16.3.10.1. The loadmaster will not deploy equipment or personnel until hearing and seeing the green light. ***EXCEPTION*****:** During manual parachute flare, streamer, marker smoke, or sea-dye delivery and for rescue airdrops using the SEARCH AND RESCUE Checklist, the loadmaster may deploy equipment on the pilot's verbal command.

17.16.3.10.2. The pilot will make any small corrections required to maintain the track.

17.16.3.10.3. The navigator will monitor the time to "Red Light".

17.16.3.10.4. The loadmaster will advise the pilot when the load is clear, and of any delay or malfunction.

**17.17. Slowdown Procedures. (T-1)** During airdrop operations, the pilot will perform the slowdown maneuver and accomplish the SLOWDOWN Checklist at a predetermined point prior to the release point. A computer position or prebriefed timing procedure may be used when an easily identifiable geographical point is not available. Begin slowdown at a distance commensurate with proficiency of crew, normally 5 to 7 NM. After the navigator calls for the slowdown:

17.17.1. The pilot retards the throttles toward flight idle (0-1000 inch pounds of torque).

17.17.2. The PM or flight engineer (as briefed) lowers the flaps in 10 percent increments on speed.

17.17.3. For paratroop door drops, the PM opens the air deflector doors (if required) upon slowing below 150 KIAS. Once air deflector door are called "Open," the loadmaster is automatically cleared to open the paratroop door. ***WARNING:*** If an air deflector fails to open, do not open the respective paratroop door. Notify the pilot of the problem.

17.17.4. For tailgate drops, the flight engineer calls "Doors" at or below 150 KIAS, as part of the checklist. The loadmaster states "Clear To Open", followed by the pilot. The flight engineer then opens the cargo door and ramp.

17.17.5. For CDS airdrops, reset the flaps IAW the CDS flap setting chart in the abbreviated checklist only. ***NOTE*****:** The aircraft must be level at drop altitude and airspeed by green light time. ***EXCEPTION*****:** During personnel airdrops, the aircraft must be at or above drop altitude and stable not later than 1 minute out (2 minutes out for jumpmaster directed drops) to allow the jumpmaster access to the paratroop door. (T-2)

17.17.6. Complete the SLOWDOWN Checklist and One-Minute Warning.

17.17.7. Descending Slowdown. At slowdown, upon reaching 140 KIAS, descend to drop altitude.

17.17.8. [For MCAD] At slowdown, do not initiate descent until the following conditions are met:

17.17.8.1. Position is positively identified and at or past the DZ entry point.

17.17.8.2. The aircraft is within 3 NMs of DZ run-in course centerline. ***WARNING:*** Analyze pre-drop gross weight to determine if obstructions can be cleared with one engine inoperative. If obstruction clearance cannot be met reduce aircraft gross weight, revise run-in and/or escape course, or increase drop altitude.

17.17.9. Complete the aerial delivery.

**17.18. Ramp and Door Operations. (T-2)** Depending on the tactical situation, the pilot may direct ramp and door opening anytime after the Six-Minute Advisory has been completed and 150 KIAS has been achieved. After the ramp and door are open, loadmasters are cleared to complete their slowdown checks. ***WARNING*****:** For personnel airdrops, the pilot must be aware of paratroopers standing in the back and avoid drastic pitch or bank changes after the Six Minute Advisory.

**17.19. Aircrew No Drop Decisions. (T-1)**

17.19.1. Prior to the "One-Minute Warning" call, any crewmember who determines a condition exists that could jeopardize a safe drop will notify the aircraft commander. A "No Drop" will be called at the discretion of the aircraft commander.

17.19.2. After the "One-Minute Warning" call, any crewmember observing a condition that would jeopardize a safe drop will transmit "No Drop" on interphone. The PM, navigator and loadmaster will immediately acknowledge the "No Drop" call. The loadmaster will accomplish the applicable no-drop procedures before performing the COMPLETION OF DROP Checklist. The PIC must ensure the crew is aware of what the plan is in the event of a no drop (racetrack, alternate DZ, RTB, etc.) and instruct the crew to follow the appropriate procedures.

17.19.3. Checklist may still be in progress after the "One-Minute Warning." Call "No Drop" if all checklists are not completed by the "5 Seconds" call.

17.19.4. If a "No Drop" is called after load restraint is removed and a racetrack is not planned, restraint will be reapplied.

**17.20. Airdrop Malfunction/Emergency Procedures. (T-1)** If a malfunction occurs during an airdrop, the loadmaster will immediately notify the pilot and take appropriate action. After all appropriate emergency actions are completed; accomplish the COMPLETION OF DROP Checklist. Detailed emergency briefings will be conducted between the loadmasters, crew, and jumpers. Loadmasters will brief visual and verbal signals and establish coordinated tasks for their crew position prior to the first airdrop warning.

**17.21. Departure from Drop Zone (Escape). (T-1)** The navigator will call "Red Light" at the expiration of the "Green Light" time or upon hearing the loadmaster's call of "Load Clear," whichever occurs first.

17.21.1. When the red light is turned on, immediately begin the escape maneuver by tracking flaps if required, turning to the departure heading, increase airspeed to 140 KIAS, and attain en route altitude. To facilitate static line retrieval and preclude entanglement, do not exceed 140 KIAS until the static lines are retrieved.

17.21.2. Accelerate to 140 KIAS, climb or descend as briefed, and perform the COMPLETION OF DROP Checklist. ***NOTE*****:** During combat, static lines that cannot be retrieved will be cut so that doors can be closed. Close all doors, raise flaps, and accelerate to en route airspeed. It is imperative that the aircraft be configured for high speed evasive maneuvers. Therefore, after the static lines have been retrieved or cut, the doors and air deflectors closed, and flaps raised, the remainder of the COMPLETION OF DROP Checklist may be deferred to a more convenient time.

**17.22. Multiple Passes (Racetrack). (T-1)** Multiple passes will not be made unless directed or previously agreed upon by all units involved. If multiple passes are flown, all airdrop checklists will be accomplished. Doors may remain open at the discretion of the PIC. Checklists may be compressed during racetracks, but the aircraft commander must ensure the loadmaster has adequate time to complete all items before the drop is initiated. The One Minute Warning is never compressed and is always given on time. ***EXCEPTION*****:** During pilot directed airdrops, the checklist may be initiated at a point commensurate with the available time and type of drop.

**17.23. Water DZs.** Water drops can be conducted on marked or unmarked DZs. Refer to AFI 13-217 for further guidance.

**17.24. Pararescue JMD (PJMD) Fixed, Moving, and Crosswind Target Patterns. (T-1)** These procedures may be used for JMD deployment of pararescue personnel and/or equipment only.

17.24.1. Pre-Deployment Evaluation. In a permissive environment, evaluation of the landing surface and surrounding obstructions should be accomplished by observation passes. Evaluation of the weather should include existing and forecast temperatures, wind direction, precipitation, cloud cover, fog, visibility, etc. Wind velocity evaluation will include consideration of direction, gusts, and wind shear. The crew should keep the jumpmaster advised of current mean altitude winds. The presence of rocks or stumps may impose a lower maximum velocity while the presence of trees, unfrozen tundra, or soft snow might permit safe jumping at higher velocities.

17.24.2. General. Pararescuemen wearing static line parachutes will normally deploy through a single paratroop door or off the cargo ramp (tailgate). The parachute static lines will be connected to the anchor cable on the same side the static line retriever is installed. No more than 20 parachutists may exit on a single pass using the long cable either from the paratroop door or off the ramp. Streamer/spotter chutes will be used prior to JMD deployments using Pararescue Fixed Target, Moving Target, or Crosswind Target deployment patterns.

17.24.2.1. Streamers are 20-foot lengths of crepe paper weighted on one end. The spotter chute used is the standard J-1 (12 foot diameter) wind drift determination parachute. The spotter chute weight can be provided by the PJ or a MK-6 Mod 3 smoke. When the MK-6 Mod 3 is used, the jumpmaster will signal the safetyman/loadmaster when to launch the smoke. Immediately upon receiving the signal, the safetyman/loadmaster will simultaneously activate and launch the smoke.

17.24.2.2. The safetyman/loadmaster will assist the jumpmaster in launching the streamer/spotter chute and will remain at the door during pararescue deployments. The jumpmaster, pilot, and navigator will confirm the exit point prior to release. ***NOTE*****:** For low altitude JMD PJ drops, a navigator's CARP is not required when using streamers/spotter chutes. ***WARNING*****:** During paratroop door static line personnel drops, personnel will not position themselves directly under the center anchor cable supports (A-frame, FS 737).

17.24.3. Deployment Pattern. The normal flight pattern will be a racetrack pattern, with the final approach from spotting device to target. ***NOTE*:** See AFI 11-231 for detailed guidance on Pararescue Fixed Target, Moving Target, or Crosswind Target deployment patterns.

17.24.3.1. The pattern will be large enough to allow for heading corrections on final approach. The crosswind leg will be made as soon as possible after the spotting device or jumper clears the aircraft. It is important that the target area remain in sight at all times.

17.24.3.2. The aircraft will be maneuvered at 150 KIAS or below in a racetrack pattern.

17.24.3.3. Aircraft Configuration.

17.24.3.3.1. Deployment airspeed is 125 KIAS.

17.24.3.3.2. Set flaps to 50% below 140,000 lbs and 70% at or above 140,000 lbs. ***NOTE*:** Pararescuemen will not be deployed from aircraft with gross weights greater than 155,000 lbs.

17.24.3.4. The jumpmaster must be kept advised of the position of the aircraft in the pattern and the aircraft commander must be kept informed of the activities in the rear of the aircraft.

17.24.4.1. Leave the red light on for dry passes and streamer/spotter chute patterns.

17.24.4.2. On final for live drops, the pilot will make a "Crew, One-Minute Warning" call, ***CAUTION*: (T-1)** For the confined lake or near shore water drops of pararescue personnel or RAMZ training, do not call "Crew, One-Minute Warning" until over water. Call “No Drop” if the exit point for the RAMZ will be over land. ***NOTE*:** The deployment pattern may be flown on autopilot.

17.24.5. Post-Deployment. Maintain visual or radio contact with the pararescue team and maintain surveillance of the area for possible natural or man-made hazards. After pararescue deployment, the PIC will notify the appropriate agencies to ensure required team support is provided. Every effort will be expended to ensure that the pararescue team is covered by rescue aircraft until the party is assured of surface assistance. Surface assistance for land operation is not required as long as sufficient supplies are available. Prior to departure of the aircraft from the incident site, resupply schedules, communication schedules, supply requirements, and planned actions of the pararescue team will be established by the PIC and team leader.

17.24.5.1. Primary and alternate frequencies, schedules, and an alternate method of communication will be established by the mission commander and will be included in the mission commander’s pre-mission brief.

17.24.5.2. If practicable, the pararescuemen will immediately establish radio contact with the drop aircraft upon penetration of the incident site. The team leader will verify the predetermined schedule for the next radio contact before the drop aircraft departs the area.

17.24.5.3. In the event the pararescue team fails to establish communication at the initial pre-briefed time, maximum effort will be made on the next check or the alternate schedule until radio contact is established.

17.24.5.4. If communication cannot be established through the procedures outlined above, any other method of communication may be used to relay information to the rescue team.

**17.25. Pararescue Deployments to Ships. (T-1)** Many factors affect the decision to deploy PJs to ships at sea, precluding the establishment of a single procedure that will apply to all situations. In all cases, thorough preplanning and coordination with the recovery vessel is vital to a safe and successful operation. The following will provide guidelines and considerations:

17.25.1. In sea conditions other than calm, it is essential the ship have a motorized launch in the water prior to team deployment, unless the PJ team deploys with a Rigging Alternate Method Zodiac watercraft. ***WARNING*****:** The aircrew will prepare an MA-1 sea rescue kit for deployment from the cargo ramp as soon as practical following an open water PJ deployment (not required for training).

17.25.2. Positioning and maneuvering of the ship, motorized launch, and deployment of the MA-1 kit is the ship captain's decision. When possible, the aircraft commander should advise the ship captain on positioning and maneuvering prior to deployment. The crew should determine whether the ship can remain still in the water, whether the ship will be steered into the wind or crosswind, and where the launch will be positioned.

17.25.3. The rescue aircraft should deploy the pararescue team to the motorized launch. The launch should maintain its position during the deployment pattern. ***WARNING*****:** The crew will make every effort to advise the ship to shut down its propellers anytime a pararescuemen is in the water alongside side it.

17.25.4. In the case that a decision is made to deploy the team without the use of a motorized launch, it is critical that the method of boarding is verified prior to deployment.

**17.26. High Altitude Airdrop Oxygen Requirements (T-1).** AFI 11-202V3 *General Flight Rules* is the source document for oxygen requirements for unpressurized and pressurized aircraft operations and the associated time limits. Crewmembers will follow established MAJCOM oxygen mask requirements. AFI 11-409, *High Altitude Airdrop Mission Support Program*, is the source document for high altitude airdrop oxygen, prebreathing and Physiology Technician (PT) requirements/restrictions.

17.26.1. Only essential personnel who have accomplished appropriate physiological training described in AFI 11-403, *Aerospace Physiological Training Program* are permitted on mission aircraft for airdrops above 10,000 feet MSL.

17.26.2. A continuous supply of 100 percent oxygen will be used during unpressurized operations IAW **Table 17.3** ***EXCEPTION:*** Parachutists may operate without the supplemental oxygen during unpressurized flight up to 13,000 feet MSL provided the elapsed time above 10,000 feet MSL does not exceed 30 minutes per sortie. Under circumstances other than these, jumpers will use supplemental oxygen.

17.26.3. All personnel will prebreathe 100 percent oxygen below 16,000 feet MSL pressure altitude or cabin altitude on any mission scheduled for an exposure at or above FL 200. See **Table 17.3** for prebreathing times extracted from AFI 11-409. When the aircraft oxygen system does not provide sufficient oxygen regulators for all personnel, approved portable oxygen console(s) will be pre-flighted and installed in the aircraft. The console(s) will provide enough oxygen regulators for all parachutists and crewmembers not accommodated by the normal aircraft system. ***NOTE:*** Portable oxygen bottles will not be used for pre-breathing; the quick-don/smoke mask is emergency equipment and is not approved for pre-breathing or operations conducted at or above FL 200.

17.26.4. All airdrops above 25,000 feet MSL require a waiver to AFI 11-202V3 for unpressurized flight, from Air Force Flight Standards Agency (AFFSA).

**Table 17.3. Prebreathing Requirements and Exposure Limits for High Altitude Operations.**

| Altitude | Oxygen Requirement | Pre-breathe Time (2) | Maximum Exposure Time Per Sortie (1) |
|---|---|---|---|
| **Above 10,000 to 13,000 ft MSL** | Aircrew: 100% O2<br>Jumpers: See AFI 11-409 | N/A | Aircrew: Unlimited<br>Jumpers: See AFI 11-409 |
| **Above 13,000 ft MSL to FL199** | 100% O2 | N/A | Unlimited |
| **FL 200 to FL 249** | 100% O2 | 30 Min | 110 Min |
| **FL 250 to FL 299** | 100% O2 | 30 Min | 60 Min |
| **FL 300 to FL 349** | 100% O2 | 45 Min | 30 Min |

**NOTES:**

(1) Maximum exposure time per sortie is when cabin altitude reaches maximum planned altitude; extended or delayed ascent times expose everyone onboard to greater DCS risk; missions that require staggered altitude drops will use accumulative times per sortie information for mission planning. See AFI 11-409 for additional information.

(2) No more than 3 Pre-breather sorties in a 24-hour period unless otherwise restricted.

**17.27. High Altitude Airdrop Procedures. (T-1)** Airdrops conducted above 3,000 feet AGL are considered high altitude drops. ***EXCEPTION*****:** RAMZ airdrops at or below 3,500 feet AGL are considered low altitude drops.

17.27.1. Cabin differential pressure will be managed to have cabin altitude equal to the ambient pressure prior to completion of the TEN-MINUTE checklist. Depressurization will not exceed 3,000 ft per minute. ***NOTE:*** If any jumpers are still onboard, ensure the parachutes automated actuation devices are disabled prior to descending or repressurizing.

17.27.2. A pre-mission HARP solution will be calculated based on preflight weather and winds.

17.27.3. For all HALO/HAHO operations, navigators will provide the jumpmaster with a magnetic course +/- 5 degrees and a distance (NM, KM, or meters) from the release point to the drop zone.

17.27.4. Navigators will compare their HARP location and calculations with the jumpmaster’s chart and calculations. In-flight changes to the HARP location or significant wind changes will be relayed to the jumpmaster as soon as possible.

17.27.5. The SCNS wind may be used to update preflight HARP winds and to determine and update the winds at altitude, provided the SCNS TAS is accurate [within 5 knots of TAS as determined by TAS check].

17.27.6. The SCNS will be used to assist in properly aligning the aircraft on the inbound course.

17.27.7. All available radio aids may be used to assist in locating the HARP but will not be relied on as the sole means for release. ***NOTE*****:** For HALO, positive identification of the drop zone area must be confirmed electronically or visually prior to calling the release.

17.27.8. Low level flight to the target area with a climb is most desirable for HALO or HAHO operations. This will enable the navigators to obtain current winds for updating the HARP. High level flights are also possible but the HARP will have to be based on preflight winds. The release may be accomplished visually.

17.27.9. On all training and exercise missions, unless prevented by airspace restrictions, update the preflight winds at each altitude used to compute the HARP. Obtain these winds as near the DZ as possible.

17.27.10. The aircraft should be at drop altitude, inbound to the HARP not later than 6 minutes prior to the HARP. This amount of time is necessary for the navigator to update the HARP and to position the aircraft on the correct inbound course.

17.27.11. High Altitude Emergency Procedures. If any person experiences decompression sickness or unusual pain, the PIC will:

17.27.11.1. Abort the mission.

17.27.11.2. Begin descent (pressurization and descent will be determined by the type and degree of sickness or pain).

17.27.11.3. Ensure the affected person remains on 100 percent oxygen until a medical doctor determines the type of treatment required.

17.27.11.4. Proceed to the nearest base/location with qualified medical assistance available.

17.27.11.5. Advise the control agency of the emergency and request an ambulance meet the aircraft.

17.27.11.6. Advise attending physician to call USAF Hyperbaric Medicine Division; during duty hours call DSN 554-3483 or (210) 292-3483 and after duty hours call DSN 554-5990 or (210) 292-5990. For out of area medical assistance, call the Divers Alert Network (DAN) at 1-800-446-2671. MAJCOM/SG and Wing/Unit Safety (SE) will be notified by the most expeditious manner of any physiological incident.

**17.28. Personnel Drops. (T-1)**

17.28.1. Briefings. The PIC will ensure all aspects of personnel airdrops are discussed in detail at the Pilot-Jumpmaster and Navigator-Jumpmaster briefings. Use the pilot-jumpmaster and navigator-jumpmaster briefing guides found in AFI 11-2HC-130V3 CL-1.

17.28.2. Aircrew Procedures. Use the PERSONNEL/EQUIPMENT AIRDROP or SEARCH AND RESCUE DEPLOYMENT Checklist as appropriate.

17.28.2.1. Flaps. Configuration is 50 percent flaps. ***EXCEPTION:*** CDS combination drops or PJMD airdrops above 140,000 pounds aircraft gross weight.

17.28.2.2. Airspeed. The jumpmaster will be briefed on the airspeed used.

17.28.2.3. Pararescue/Jumper Minimum Operating Speed. The flight engineer will compute a PJ MOS for all static line personnel drops and post this information on the TOLD card. Compute data using power off stall speed with 50 percent flap setting at 30 degree bank angle plus 5 knots.

17.28.2.4. Altitude. Pressure altitude will be used as the airdrop altitude reference.

17.28.2.5. Exits. Low altitude personnel drops are normally accomplished from the paratroop doors. If the aircraft is configured with a static line retriever, static line tailgate drops of personnel are authorized. ***NOTE:*** Tailgate drops are those drops during which parachutists exit from the aircraft ramp. Low altitude tailgate drops are approved for STT, PJ, Air Force Survival Evasion Resistance Escape (SERE) Specialists, Army Special Forces, Navy SEALS, paratroopers equipped for arctic airdrop, other US and allied special operations personnel, US Army Quartermaster Center and School, Yuma Proving Ground Airborne Test Force, and units for which a combination drop is their normal method of deployment.

17.28.3. Drop Configuration. The aircrew loadmaster will ensure the configuration of the aircraft anchor cables and seats are consistent with the number of personnel to be airdropped. During aircraft preflight, the loadmaster will ensure that all seats have a serviceable retaining strap attached. Fit seats without a serviceable retaining strap with a suitable length of type III nylon, pre-measured for sufficient length to secure the seat in a raised position to the seat back support frame. For single pass drops, ensure that parachutists have secured all seats (as required) and no part of the seat protrudes into the aisle. On multiple passes, the number of parachutists to be dropped on that pass determines the number of seats raised. Airborne, personnel will raise and secure or lower seats as required under the supervision and instruction of the aircrew loadmaster. ***WARNING:*** During paratroop door static line drops, personnel will not position themselves directly under the center anchor cable supports (A-frame, FS 737). Personnel in the cargo compartment during tailgate drops will not position themselves below the static line retriever cable while the cargo ramp and door are open. ***WARNING*:** Ensure all personnel aft of FS 677 are secured to the aircraft or have a static line connected prior to opening the ramp and door/troop door. HALO/HAHO personnel must be configured and ready to jump.

17.28.4. Loadmaster-Jumpmaster Control.

17.28.4.1. At completion of the SLOWDOWN Checklist, the loadmaster will allow the jumpmaster access to the paratroop door or ramp no later than (NLT) 1 minute prior to jump.

17.28.4.2. For jumpmaster-directed airdrops using the SEARCH AND RESCUE DEPLOYMENT Checklist, after Pre-Deployment checks are complete, the loadmaster will allow the jumpmaster access to paratroop door or ramp NLT 2 minutes prior to the jump.

17.28.4.3. The loadmaster will then take position in such a manner as to provide maximum maneuverability for the jumpmaster and safety personnel to perform their duties, and to prevent interference with exiting jumpers. Upon seeing the red jump lights illuminate, the loadmaster will notify the jumpmaster or safety personnel of the red light condition. The loadmaster will take no further action to stop any of the remaining parachutists. The loadmaster will count (if possible) any parachutists that exit the aircraft after the red light has illuminated. ***WARNING*****:** Do not attempt to physically stop or hinder jumpers from exiting the aircraft if jumpers continue to exit after "Red Light".

17.28.4.4. Control of the paratroop door/cargo ramp will revert back to the loadmaster after all parachutists have exited or remaining parachutists have been stopped by the jumpmaster or safety person and cleared from the paratroop door/cargo ramp area.

17.28.4.5. For multiple passes (i.e., racetracks), after assuming control of the paratroop door/cargo ramp from the jumpmaster, the loadmaster(s) will maintain control of the doors/cargo ramp until completion of subsequent SLOWDOWN Checklist.

17.28.5. Aircraft Emergency During Personnel Drops. When an aircraft emergency occurs during or after the time the parachutists stand-up and hookup, the following procedures will apply:

17.28.5.1. Under Acceptable Conditions: Maintain an acceptable altitude and attitude for the parachutists to evacuate the aircraft. The minimum acceptable altitude is as briefed due to the differences in parachute employment limitations (Reference AFI 11-410, *Personnel Parachute Operations*). If the jump must be made at airspeed in excess of 150 KIAS, advise parachutists of the airspeed and altitude. Order evacuation of the aircraft by giving the prebriefed signals for preparation and bailout.

17.28.5.2. Under Unacceptable Conditions. When conditions are not acceptable for aircraft evacuation or drop is aborted for other reasons, the following procedures will apply: The red light will be turned "On" and will remain on until exit doors are closed. The pilot will advise the loadmaster, who in turn will advise the jumpmaster, to have the parachutists unhook, take their seats, and fasten their safety belts.

17.28.6. Fouled/Towed Parachutist Procedures.

17.28.6.1. The jumpmaster or safety is responsible to observe the fouled parachutist and recommend whether to retrieve or cut the parachutist free. If all parachutists have exited and there is no jumpmaster on board, this responsibility rests with the loadmaster. The recommendation is relayed, by the loadmaster, to the pilot who makes the final decision whether to retrieve or cut the parachutist free. The loadmaster will initiate retrieval or cut the parachutist's static line on the pilot's command.

17.28.6.2. If the parachutist is fouled during a paratroop door exit, the first priority is to retrieve, whether the parachutist is conscious or unconscious. If the parachutist cannot be retrieved and indicates consciousness, the parachutist will be cut free. For a ramp exit, the first priority is to cut the parachutist free if the parachutist indicates consciousness. If the parachutist is unconscious, does not signal, cannot be observed, or a condition exists that prevents cutting the static line, implement emergency retrieval procedures. ***WARNING:*** There is not an effective or consistently reliable means to manually retrieve a fouled parachutist from either the paratroop door or ramp and door. Manual retrieval techniques will vary, depending upon the scenario, and should be exercised with extreme caution.

17.28.6.3. Upon being notified of a fouled parachutist:

17.28.6.3.1. The jumpmaster stops remaining parachutists and the loadmaster notifies the pilot of a fouled parachutist.

17.28.6.3.2. The pilot should lower the landing gear and configure the aircraft flap setting to 100 percent flaps (paratroop door exits only). ***WARNING:*** If a parachutist becomes fouled during missions when the aircraft is operating with a high gross weight or is flying in a high density altitude environment, the pilot may elect to maintain flaps at 50 percent, landing gear up, and slow to PJ MOS in lieu of the standard procedure.

17.28.6.3.3. The pilot maintains at least the minimum drop altitude (AGL) for the type parachute being used, and avoids flying over or upwind of water or built up areas. ***EXCEPTION:*** If the parachutist is equipped for a water drop, the pilot should avoid flying over land. ***CAUTION:*** If possible, the pilot will avoid turning the aircraft in the direction of the fouled parachutist. Turning into the parachutist often starts violent swinging of the parachutist and poses an increased possibility of injury.

17.28.6.3.4. The PM turns on the red light.

17.28.6.3.5. The parachutist indicates consciousness and that the reserve parachute is ready by maintaining a tight body position with both hands on the reserve parachute.

17.28.6.3.6. If the pilot‘s decision is to cut the parachutist free, the parachutist‘s static line will be cut by the loadmaster on the pilot‘s command.

17.28.6.3.7. If the decision is to retrieve the parachutist, refer to expanded checklist and AFI 11-2HC-130V3 CL-2 for procedures.

17.28.7. High Altitude Personnel Airdrop Specific Procedures. See **paragraphs 17.26** and **17.27** for additional information on high altitude airdrops requirements and procedures.

17.28.7.1. The navigator will compute a high altitude release point (HARP) solution for all HALO or HAHO drops unless specific mission directives dictate otherwise. ***NOTE:*** HALO or HAHO drops may be JMD.

17.28.7.2. Flaps. Normal configuration is with 50 percent flaps. However, at high altitudes, it may be desirable to use less flaps.

17.28.7.3. Exits.

17.28.7.3.1. Parachutists will normally exit from the cargo door and ramp. All parachutists, with the exception of the jumpmaster, will stand forward of the ramp hinge until the One-Minute Warning.

17.28.7.3.2. A paratroop door may be used in lieu of the cargo door and ramp. When this is the case, air deflector doors will be opened. All parachutists, except jumpmaster, will stand forward of the paratroop door until the One Minute Warning. ***NOTE*****:** Jump platforms must be installed. ***NOTE*****:** All parachutists, including jumpmaster, will exit the aircraft during the green light time.

17.28.7.4. Communications and Signals. The loadmaster will coordinate the following hand signals with the jumpmaster:

17.28.7.4.1. Time warnings (20-, 10-, 6-, 2-, and 1-minute) may be given to the parachutists by the loadmaster pointing at a watch and then indicating with fingers the correct warning.

17.28.7.4.2. The velocity of winds on the DZ will be given by the loadmaster by cupping one hand and blowing into it, then indicating with upturned fingers the speed of the wind.

17.28.7.4.3. A no drop will be indicated by passing a hand across the throat.

17.28.7.4.4. Loadmasters will have pencil and paper available during airdrops for use in communicating with parachutists.

**17.29. Combination Drops. (T-1)** Combination drops are those during which parachutists exit from the aircraft ramp after the deployment of an airdrop load (CDS, Combat Rubber Raiding Craft (CRRC), Container Ramp Load, etc).

17.29.1. The drop altitude will be determined by the item requiring the highest drop altitude.

17.29.2. Procedures. In addition to the equipment CARP, the navigator will compute a personnel CARP down track from the equipment release point using the computed exit time for the equipment drop as the interval between the equipment and personnel CARP. Use the same air speed and altitude as for the equipment for this computation. If the computed release point will result in any jumper landing within 150 yards of any boundary of the DZ, inform the jumpmaster. Release the equipment at the equipment CARP, followed by the parachutists when the door is clear.

**17.30. Door Bundle Airdrops. (T-1)** A-7A or A-21 containers weighing up to 500 pounds [excluding the weight of the parachutes] are referred to as "door bundles" and are dropped from the aircraft through the paratroop door or ramp and door using the PERSONNEL/EQUIPMENT AIRDROP or SEARCH AND RESCUE DEPLOYMENT Checklist. Loads weighing more than 350 pounds require two trained designated pushers to assist the loadmaster/jumpmaster in pushing loads from the aircraft.

17.30.1. Door bundles may be dropped independently or with personnel and are limited to one bundle per exit used. When dropped with personnel, the bundle is the first object to exit the aircraft.

17.30.2. During unilateral single-ship airdrop training, door bundles will not exit aircraft after a paratrooper has jumped. ***NOTE:*** During joint training, a combat or contingency operation, the user determines door bundle requirements and order of exit from any or all personnel airdrop aircraft in the formation.

17.30.3. Remove restraints and position the bundle in the paratroop door or on the ramp prior to completion of the SLOWDOWN checklist (***EXCEPTION:*** If the jumpmaster needs the paratroop door for spotting, place the door bundle as close as possible to the paratroop door). If jumpers are to follow the door bundle, the user is responsible for ejecting the bundle out the troop door or off the ramp. Maintain positive control of all door bundles exiting out the cargo ramp. To maintain positive control of door bundles exiting over the ramp, it may be necessary to secure the forward end of the bundle to a suitable floor tiedown ring with 550 cord or suitable substitute. This tie is to prevent premature release of the bundle and will be cut by the loadmaster at the release point.

17.30.3.1. Door bundles dropped from the paratroop doors will be rigged with non-breakaway static lines. The dimensions, including the parachute, must not exceed 48" by 30" by 66" unless authorized in a specific T.O. When the container is placed in the door for airdrop, place the largest dimension in the vertical or upright position.

17.30.3.2. Door bundles followed by paratroopers dropped from the ramp and door or paratroop door(s) will be rigged with a T-10 parachute (converted for cargo) or parachute equipped with breakaway static lines (per TO 13C7-1-11). Also, bundles rigged for a ramp exit are equipped with a skid board compatible with the center roller conveyors. ***NOTE:*** If no parachutists are to be dropped after the door bundles, non-breakaway static lines will be used. Anchor cable stops will be positioned as depicted in T.O. 1C-130A-9 for CDS airdrops.

**17.31. Container Ramp Loads (CRL)/Ramp Bundle. (T-1)** Container ramp loads may consist of A-series containers (e.g. RAMZ bundle, double A-22, single A-22/A-23) or loads rigged on combat expendable platforms (e.g. ATV, motorcycle) rigged for airdrop from the cargo ramp or floor. CRLs are individually restrained with a length of Type VIII nylon webbing (release gate) routed through ramp/floor tiedown rings and secured to the container webbing on the forward and aft side. At the release point the loadmaster manually cuts the release gate, allowing the bundle to exit from the aircraft.

17.31.1. Ramp bundles must be rigged IAW T.O. 13C7-series, FM 10-500, and USSOCOM 350-series directives. The total weight of the bundle will not exceed 2335 pounds. Skid boards/combat expendable platforms will be compatible with intermediate roller conveyors. The total rigged weight of the load will not exceed 2,335 pounds. loads may be followed by parachutists. These procedures can be accomplished from either side of the cargo ramp or from centerline. Specific aircraft preparations and rigging procedures are contained in T.O.1C-130A-9.

17.31.2. Loads to be followed by parachutists will be rigged with breakaway static lines, unless specified in specific rigging directive.

17.31.3. The maximum number of CRLs that can be airdropped on one pass is two. When dropping two CRLs, one will be rigged on the ramp and one will be rigged on the cargo floor. When mission requirements dictate dropping more than two CRLs, they must be rigged in A-series containers, using CDS procedures in T.O. 1C-130A-9, and dropped using the CDS AIRDROP Checklist.

17.31.4. Aircrew Procedures. Use the PERSONNEL/EQUIPMENT AIRDROP Checklist. Use the SEARCH AND RESCUE DEPLOYMENT Checklist for PJD RAMZ/ATV CRL airdrops.

17.31.4.1. Aircraft configuration. Use 50 percent flap setting. ***NOTE:*** 50 percent flaps results in a flat deck angle ensuring the aft bundle does not move and gives the loadmaster time to cut both gates and push the bundle(s). At no time will the deck angle be nose down.

17.31.4.2. CARP Calculations. Reference **paragraph 17.29.2** for combination drops. ***NOTE:*** For dual CRL drops, personnel exit time is computed from the time the forward bundle (bundle resting on the cargo floor) exits the aircraft. Crews must be aware that the exit time will be longer for multiple CRL drops and factor this into usable drop-zone time. ***NOTE:*** If the load is rigged on the ramp, recommend using a 2 second exit time for 50 percent flaps. Otherwise, interpolate exit time using data listed in AFI 11-231, Table 9.19.

17.31.5. Loadmaster Procedures. The procedures listed below are for use with the PERSONNEL/EQUIPMENTAIRDROP Checklist.

17.31.5.1. Aircraft Preparation**.** Prepare the aircraft IAW T.O. 1C-130A-9.

17.31.5.1.1. Use two rollers under each bundle. Remove and stow all other rollers to allow a clear path of travel for the loadmasters and jumpers.

17.31.5.1.2. Loadmaster will use restraint harnesses when dropping using these procedures

17.31.5.2. After loading. Rig the bundle(s) IAW T.O. 1C-130A-9.

17.31.5.2.1. For a CRL bundle resting on the floor, position the 8/7-cord static line safety tie on the aft left (HC-130)/right (MC-130) side of the bundle if the jumpers are using static line parachutes

17.31.5.2.2. For a CRL bundle resting on the floor, position the 8/7-cord static line safety tie on, on the aft right (HC-130)/ left (MC-130) side of the bundle if the jumpers are using free fall parachutes.

17.31.5.3. Ten-Minute Checklist.

17.31.5.3.1. Before completion of the TEN-MINUTE Checklist, if dropping two CRLs, the loadmasters may remove all the restraint from the CRL resting on the floor and all the restraint, except the forward restraint strap, on the CRL positioned on the ramp. The forward restraint will be removed after the ramp is in the horizontal position, prior to the completion of the SLOWDOWN Checklist.

17.31.5.3.2. If the drop is aborted, reapply all the bundles restraint.

17.31.5.4. One-Minute Warning.

17.31.5.4.1. The jumpers are cleared to line up along side of the CRL resting on the floor but will not move aft of FS 737 or behind the forward CRL static line, which ever is more restrictive.

17.31.5.4.2. At the navigator's "5 Seconds" call, the loadmasters will move into position to cut the bundles Type VIII gates. One loadmaster will be in position to cut the aft bundle while the other loadmaster will be in position to cut the forward bundle.

17.31.5.5. Green Light.

17.31.5.5.1. After hearing and seeing green light, the loadmaster will cut the gate of the aft bundle (bundle resting on the ramp) with a V-blade knife (the bundle may begin to exit depending on deck angle) and quickly move forward to assist in pushing the forward bundle (resting on the cargo floor).

17.31.5.5.2. Once the loadmaster is forward of all bundles and clear of all the static lines, the second loadmaster will cut the forward CRL gate.

17.31.5.5.3. After both gates have been cut the loadmasters will push the bundles out together as quickly as possible. The loadmasters should be prepared to exert extra force on the bundles once they contact each other.

17.31.5.5.4. The jumpers are clear to follow once the forward bundle has crossed FS 737.

17.31.6. Emergency Procedures. Follow either CDS emergency procedures or fouled parachutist procedures as required.

**17.32. Container Delivery System (CDS). (T-1)** CDS is designed to airdrop A-22/A-23, A-7, A-21, double A-22/A-23 containers and loads rigged on combat expendable platforms. The weight of each container and type parachute used should be IAW T.O. 13C7-1-11, *Airdrop of Supplies and Equipment—Rigging Containers* and Field Manual 10-501, *Airdrop of Supplies and Equipment: Rigging Containers*.

17.32.1. CDS procedures may be used to airdrop up to five individual A-22 containers, single stick, from Rescue HC-130 without a dual rail cargo handling system (intermediate rollers are required). Containers can be rigged and dropped one at a time or up to five in a single stick.

17.32.2. Use normal CDS rigging procedures outlined in T.O. 1C-130A-9, with the following exceptions: the release gate for single containers, multiple containers rigged in a single stick configuration or combat expendable platforms that do not exceed 3500 pounds, may be rigged using Type VIII nylon. For loads between 3100 pounds and 3500 pounds the release gate will be rigged using one turn double Type VIII nylon. For single stick container loads that exceed 3500 pounds use Type XXVI nylon. Multiple container releases exceeding 3500 pounds require standard rigging and release with a static line retriever as outlined in Chapter 7, T.O. 1C-130A-9. After the release gate is cut, the airdrop load exits the aircraft by gravity force. ***CAUTION:*** Standard tiedown procedures contained in T.O. 1C-130A-9 will be used to secure airdrop loads in the aircraft. Because a buffer stop assembly cannot be installed, the normal maximum total container weight is 5000 pounds. When the total rigged weight of the airdrop load exceeds 5000 pounds, MAJCOM/A3T (A3J for ACC) approval is required.

17.32.3. Aircrew Procedures.

17.32.3.1. Use the CDS AIRDROP Checklist.

17.32.3.2. Flap Settings. Accomplish the slowdown initially setting flaps to 50 percent. As the airspeed decreases to drop airspeed, reset the flaps IAW the CDS flap setting chart located in AFI 11-2HC-130 CL-1. ***NOTE***: The CDS flap setting will give an approximate 6 to 8 degree nose-high attitude. Maintain this attitude and level flight throughout the drop.

17.32.3.3. The aircraft will tend to pitch up as the load exits the aircraft. ***WARNING*****:** This pitch must be anticipated and controlled to allow no more than two or three degrees additional pitch. Do not over control to the point that negative G forces are encountered while the load is exiting the aircraft, as this increases exit time or may stop load movement.

17.32.3.4. It is not recommended to drop CDS at gross weights less than 104,000 pounds. If drop must be made, use zero flaps and expect longer than normal exit time.

17.32.3.5. When the loadmaster calls "Load Clear", the flaps will be reset to 50 percent.

17.32.3.6. Gate Cuts. Manual CDS gate cuts are authorized for all single stick container loads that do not exceed 5000 pounds total rigged weight. The following procedures and definitions further explain and clarify limitations:

17.32.3.6.1. Normal System Release. The normal system release method utilizes normal rigging of the static line retriever and guillotine knife to cut/release the CDS gate. The CDS gate is cut by activating the static line retriever. Refer to T.O. 1C-130A-9 for specific rigging procedures. A subsequent drop will prevent the use of the static line retriever and requires an alternate method of gate release. Alternate methods of cutting the release gate are described below in the following paragraphs.

17.32.3.6.2. Manual System Release. This method is performed by the loadmaster pulling down sharply on a tiedown strap looped over the static line retriever cable. Loadmasters will delay three seconds after "Green Light" is called before performing a manual system release. This method can only be used when authorized by the mission commander.

17.32.3.6.3. Manual Gate Cut. This method is performed by using a knife or V-blade knife to cut/release the CDS gate. Loadmasters will manually cut the CDS release gate upon hearing and seeing "Green Light" during the execution of the CDS AIRDROP Checklist. All single stick container loads that do not exceed 5000 pounds may be released using the manual gate cut method.

17.32.3.6.4. Manual Combat Cut. This method is performed by using a knife or V-blade knife to cut/release the CDS gate regardless of the amount/configuration of CDS on board. It is intended to be used only in combat and only after receiving authorization from the mission commander. This method allows loadmasters to scan for threats more efficiently prior to and immediately after the drop. Mission commanders should carefully consider crew experience prior to authorizing this procedure and extreme caution should be used.

17.32.3.7. Combination Airdrops. During combination CDS drops:

17.32.3.7.1. The jumpers will line up forward of the alternate forward barrier at the 10-minute warning.

17.32.3.7.2. After hearing and seeing green light, one loadmaster will cut the release gate manually or via the static line retriever.

17.32.3.7.3. The other loadmaster will immediately lower the forward barrier as the loads begins to exit from the aircraft allowing the PJs to exit directly behind the CDS loads.

17.32.4. CDS Emergency Procedures. If the release gate fails to cut or the load fails to exit. The crew will take the following corrective actions:

17.32.4.1. When notified of a malfunction, the pilot will direct the flight engineer or PM to extend additional flaps and lower the nose to maintain a slight nose down attitude until the ramp and door are closed and the load is secured.

17.32.4.2. PF will maintain drop airspeed and AGL altitude (if possible) and avoid flying over or upwind of water or built up areas.

17.32.4.3. PM will turn on the red light.

17.32.4.4. The loadmaster will alert parachutists (if required) to remain forward/clear of the load.

17.32.4.5. The loadmaster will raise the aft anchor cable supports (if required).

17.32.4.6. The Loadmaster will clear the ramp and door to close. ***WARNING:*** When the cargo ramp and door cannot be closed from the cockpit, the loadmaster secures the load for aft movement. Ensure the lifeline is attached to a tiedown ring no further aft than FS 677 prior to proceeding aft to operate the cargo ramp and door controls. ***CAUTION:*** If the load is jammed in the ramp area, the loadmaster will notify the engineer to stop closing action when the cargo door is released from the uplocks. After the load is secured and the ramp area is clear, the loadmaster will close the ramp and door from the aft control panel (if possible).

17.32.4.7. The loadmaster will secure the load for landing

17.32.4.8. After completing the CDS MALFUNCTION Checklist, perform the COMPLETION OF AIRDROP Checklist.

**17.33. Combat Rubber Raiding Craft (CRRC) Drop. (T-1)** The raiding craft is normally an inflated, 16 foot rubber boat mounted on a specially constructed expendable platform. Equipment and supplies (including outboard motor, fuel, and other supplies) are secured inside the boat. The platform, weighted with sandbags, sinks when it is cut away from the boat in the water. Total rigged weight is approximately 2000 pounds. Rigged IAW T.O.13C7-51-21.

17.33.1. Aircrew Procedures.

17.33.1.1. Use the CDS AIRDROP Checklist. One CRRC with up to 19 personnel or 2 (stacked) CRRC with 18 personnel can be safely airdropped on one pass. Compute a CARP, unless mission directives dictate otherwise. If aircraft gross weight exceeds 120,000 pounds, perform the airdrop at 140 KIAS using the 140 KIAS flap setting chart. ***EXCEPTION:*** For combination drops above 120,000 pounds, perform the airdrop at 130 KIAS using the 130 KIAS flap setting chart.

17.33.1.2. DZ Axis. If possible, the DZ axis will be into the drop altitude wind (+ or - 30 degrees) when the wind is 5 knots or greater. The jumpmaster will be advised if this cannot be complied with.

17.33.1.3. The following will apply when dropping two CRRCs on one pass:

17.33.1.3.1. The forward release gate must be manually cut by the loadmaster.

17.33.1.3.2. The second loadmaster must be positioned in the paratroop door prior to completion of the ten-minute warning.

17.33.2. Training and Exercises**.**

17.33.2.1. One or more recovery boats will be in position to recover platforms, parachutes, and personnel. The boat should be displaced 400 yards or more from the DZ axis. The navigators can confirm the release point and the offset distance from the boat visually or by using radar returns.

17.33.2.2. Limitations. Surface wind limitations IAW AFI 13-217. For combination drops with personnel sea state limits are 3 Ft High Chop/4 Ft High Swells.

17.33.3. Emergency Procedures. Follow either CDS emergency procedures or fouled parachutist procedures as required.

**17.34. Rigging, Alternate Method, Zodiac/All-Terrain Vehicle (RAMZ/ATV) Airdrops. (T-1)** The RAMZ consists of a deflated Zodiac F470 combat rubber raiding craft with a 35 horsepower outboard engine rigged for low velocity airdrop from any C-130 aircraft. The RAMZ engine is configured in a plywood box and is secured in a standard A-22 container using two modified T-10C parachutes. When rigged for deployment, the RAMZ package weighs between 600 and 1,000 pounds. The ATV is rigged IAW Army Field Manual 10-500-77, *Airdrop of Supplies and Equipment: Rigging Motorcycles,* and Air Force Technical Order 13C7-55-1, *Airdrop of Supplies and Equipment--Rigging Motorcycles.* ATVs are rigged on combat expendable platforms and dropped using G-12E cargo parachutes equipped with 15 ft. extraction (deployment) parachute packed in T-10 deployment bag.

17.34.1. Employment. Parachutists may exit the aircraft using MFF or static line procedures.

17.34.2. DZ Axis. If possible, the DZ axis will be into the drop altitude wind (+ or – 30 degrees) when the wind is 5 knots or greater. The jumpmaster will be advised when this cannot be complied with.

17.34.3. Aircraft Preparation. The aircraft will be configured IAW AFI 11-2HC-130V3, Addenda A. The RAMZ/ATV package will be delivered to the aircraft fully rigged and prepared for loading on the aircraft. The loadmaster is responsible for aircraft preparation, rigging the release gate, attaching the static line, and securing the package in the aircraft.

17.34.3.1. RAMZ/ATV Preflight. Prior to flight, the loadmaster will ensure that no fuel is leaking from the RAMZ/ATV bundle. A leaking bundle will not be loaded aboard the aircraft or will be downloaded if already aboard. The fuel bladders have a tendency to emit fumes. If one or more RAMZ/ATV is loaded aboard the aircraft the day prior to flight, there may be noticeable fumes in the aircraft the following day. The fumes may be decreased or eliminated by venting the aircraft overnight. One technique is to close both paratroop doors onto the extended jump platforms and secure them with tie down straps.

If the RAMZ/ATV is emitting fumes and the aircraft must temporarily remain pressurized, taping the urinal covers open may reduce or eliminate the fumes. ***WARNING*****:** If flammable fumes are present, unnecessary electrical equipment/switches will not be turned on or off until the fumes are eliminated. Use 100 percent oxygen and accomplish the Smoke and Fume Elimination Checklist as appropriate. ***WARNING*****:** Only 15-foot static lines will be used on the RAMZ cargo parachutes. A 12-foot static line extended to 15 feet will not be used. If personnel are to follow immediately after the RAMZ, their static lines will also be 15 feet. ***NOTE*****:** A maximum of three RAMZ/ATV bundles can be rigged on the Rescue HC-130 when the aircraft internal fuel tanks are installed. When using CRL procedures, a maximum of 2 RAMZ/ATV bundles can be rigged on the Rescue HC-130. ***WARNING*****:** When rigging two RAMZ bundles on the cargo ramp, use extreme care to ensure the aircraft CG remains within tolerances. ***CAUTION*****:** For RAMZ deployments at night, when requested by the user, two illumination parachute flares will be loaded in the flare launcher tubes or be immediately available for manual deployment prior to starting the pre-slowdown checklist. If used, the flare launcher must remain "Deactivated" and "Safe" until personnel and equipment have deployed and are a safe distance from the aircraft. ***NOTE:*** When loaded aboard the aircraft, the vertical restraint tie down strap on the RAMZ will be secured in such a manner that it is not placed over any fuel bladder, just tight enough to take the slack out of the strap. The vertical strap acts as a backup to the 5,000-pound gate.

17.34.3.2. Airplanes with Static Line Retriever. Position the left (HC-130) or right (MC-130) anchor cable stop at FS 893 and tape. The left/right anchor cable will be utilized for attachment of both the container and the personnel static lines. ***WARNING*****:** Static lines for both RAMZ/ATV and parachutists will be hooked to the same anchor cable. No more than 20 static lines may be airdropped on a single pass (i.e., one RAMZ/ATV and 19 jumpers, two RAMZ/ATV and 18 jumpers, etc.).

17.34.3.3. Airplanes without Static Line Retriever. Install and tape anchor cable stop at FS 749 for single cable use. RAMZ/ATV static lines will be attached to this cable. ***WARNING*****:** Parachutists using static line deployed parachutes will not jump from airplanes without an operational static line retriever.

17.34.3.4. Skid boards must be a minimum of 48” by 48”.

17.34.4. Deployment Altitudes.

17.34.4.1. The minimum deployment altitude will be 3,000 feet AWL/AGL when the PJs exit using non-static line deployed parachutes. Higher altitudes may be used for training.

17.34.4.2. For operational missions, minimum altitude with non-static line deployed a parachute is 2,500 feet AWL/AGL.

17.34.4.3. The minimum deployment altitude for training or non-combat single-pass combination air drops of RAMZ/ATV and PJs exiting with static lines will be 800 feet AWL/AGL. ***NOTE*****:** The RAMZ/ATV and PJs will be deployed from the same altitude.

17.34.5. Deployment Methods. RAMZ/ATV packages will be deployed by one of the following methods:

17.34.5.1. CRL procedures. Single pass navigator directed deployment. Use the PERSONNEL/EQUIPMENT AIRDROP Checklist.

17.34.5.2. CDS procedures. Single pass navigator directed deployment. Use the CDS AIRDROP Checklist.

17.34.5.3. Pararescue JMD procedures with 50 or 70% flaps (based on gross weight). Use the SEARCH AND RESCUE DEPLOYMENT Checklist. Jumpers may exit on the same pass as equipment or on subsequent passes using PJMD procedures. See **paragraph 17.24** ***NOTE*****:** For JMD RAMZ/ATV drops, a navigator's CARP/HARP is not required when using streamers/spotter chutes.

17.34.6. Deployment Procedures. In addition to the deployment procedures required by the specific method of delivery being used, the following apply:

17.34.6.1. Parachutists using static line deployed parachutes will attach their static lines to the same anchor cable to which the RAMZ/ATV static lines are attached or jump on a subsequent pass after the RAMZ/ATV static line deployment bags are retrieved.

17.34.6.2. Military free fall parachutists may exit from the aircraft ramp on the same pass after the RAMZ/ATV static line deployment bags are retrieved or cut, or exit on a subsequent pass using Fixed/Moving target PJD procedures, as appropriate. If dropping from the paratroop door on the subsequent pass, complete the POST-DEPLOYMENT Checklist, and initiate the PRE-DEPLOYMENT Checklist.

17.34.6.3. For JMD drops, at the pilot's "One Minute Advisory" call, the jumpmaster will be on either side of the cargo ramp and may be spotting from the aft end. Additional jumpers will be forward of the RAMZ/ATV. The loadmaster will be positioned to remove aft restraint and to observe equipment and jumpers at all times. At the "One Minute Advisory," the jumpmaster will be alerted, the load release gate is checked, and the aft restraint is removed.

17.34.6.4. The loadmaster will relay "Safety Checks Complete" to the pilot if the jumpmaster has already gone off interphone. The PM will turn on the green light, indicating to the jumpmaster that conditions are satisfactory for the airdrop.

17.34.6.5. The jumpmaster will determine the exit point and deploy prior to receiving a "No Drop" notification or seeing the red light on. The loadmaster will relay to the pilot all visual corrections given by the jumpmaster. The jumpmaster will signal for the loadmaster to cut the release gate. ***WARNING*****: (T-1)** If a "No Drop" is called and the RAMZ/ATV is held in place by only the release gate, all personnel will move forward of the load, except the loadmaster and the jumpmaster who will monitor the RAMZ/ATV for possible shifting and secure as necessary. ***WARNING*****:** If the RAMZ/ATV exits the aircraft but fails to properly deploy, the static lines will be cut immediately. ***CAUTION*****:** The release gate must be cut below the knot to allow the nylon strap to pull free through floor tie down rings.

17.34.7. Completion of Drop.

17.34.7.1. During JMD airdrops, post-deployment checks can be deferred until completion of the last drop. However, crews will accomplish applicable steps of the

POST-DEPLOYMENT Checklist and re-accomplish the PRE-DEPLOYMENT CHECKLIST, as required, when necessary to change the aircraft or door configuration.

17.34.7.2. For navigator directed releases. Accelerate to 140 KIAS, climb or descend as briefed, and perform the COMPLETION OF DROP Checklist.

17.34.8. Training and Exercises.

17.34.8.1. One or more safety recovery boats will be in position to recover platforms, parachutes, and personnel. The boat should be displaced 400 yards or more from the DZ axis. The navigators can confirm the release point and the offset distance from the boat visually or by using radar returns.

17.34.8.2. Limitations. Wind limits IAW AFI 13-217.

17.34.9. Emergency Procedures. Follow either the CDS emergency procedures or fouled parachutist procedures as required.

**17.35. Standard Airdrop Training Bundle (SATB). (T-1)** The 15-pound standard airdrop training bundle may be dropped to simulate personnel or equipment. SATBs will be assembled and have an identification tag attached in accordance with T.O. 13C7-1-11. SATBs will not be rigged with a breakaway static line.

17.35.1. Aircrew Procedures. Conduct SATB missions at the altitude and airspeed specified for the drop being simulated. Use the applicable airdrop checklist for the type airdrop simulated.

17.35.2. Emergency Procedures. If a training bundle is outside the aircraft and fails to separate, make no attempt to retrieve it. Cut the bundle loose over the prebriefed salvo area or DZ. When simulating an airdrop using the cargo ramp and door, a hung bundle could become wedged in the aircraft elevator during turns. If possible, cut the static line prior to making a turn.

**17.36. Specialized Rescue Airdrops. (T-1)** Specialized rescue airdrops [parabundles and MA-1/2 Kit] will be conducted using the SEARCH AND RESCUE Checklists. See AFTTP 3-3.HC-130.

17.36.1. Minimum drop altitudes. The minimum drop altitude for parabundle and MA-1 Kit deployments is 300 ft AGL during the day and 500 ft AGL at night.

17.36.2. HC-130 aircraft are authorized to perform loadmaster directed airdrops of bundles off the ramp, to include trial-line drops, while spotting from an open paratroop door [single paratroop door open only].

17.36.2.1. This configuration will be used when equipment size precludes exit from the paratroop door or trail line drops procedures are used.

17.36.2.2. This configuration will be used for equipment only drops and is not authorized for personnel deployment. ***WARNING***: Under no circumstances will a paratroop door and ramp and door be open at the same time when parachutists are involved.

17.36.2.3. If the bundle/equipment dropped from the ramp requires spotting procedures from an open paratroop door, ensure life lines are properly adjusted for both exits.

17.36.2.4. During the PRE-SEARCH/PRE-DEPLOYMENT Checklist, open the paratroop door first, then open the cargo ramp and door.

17.36.2.5. During the POST-SEARCH/POST-DEPLOYMENT Checklist, close the cargo ramp and door first, then close the paratroop door.

**17.37. Free Fall Airdrops. (T-1)** Free fall airdrop is the delivery of non-fragile items without parachutes at very low altitudes.

17.37.1. Aircrew Procedures. Use either the PERSONNEL/EQUIPMENT AIRDROP or SEARCH AND RESCUE DEPLOYMENT Checklist.

17.37.2. Minimum Drop Altitudes. Daylight drops will be made at 150 feet AGL and night drops no lower than 300 feet AGL.

17.37.3. Drift Effect. For free-fall airdrops, wind drift need not be considered.

17.37.4. DZ size. DZ size will be determined by the trajectory of the items being dropped. As a rule, DZ length required equals the altitude of the aircraft over the release point plus a safety margin of 100 feet added to each end. Applying this rule, when dropping from 200 feet AGL, the required length will be 200 feet (altitude) plus 200 feet (safety margin) or 400 feet total. Additional crewmembers may be needed to eject the load.

**17.38. Low Cost Low Altitude (LCLA) Airdrop.** LCLA airdrop is an aerial delivery system consisting of low-weight airdrop bundles deployed from the aircraft ramp and door at very low altitudes, enabling circular error (CE) accuracy within 100 meters. Refer to applicable TO, TTP and supporting MAJCOM guidance for LCLA procedures.

# Chapter 18

# REFUELING OPERATIONS

**18.1. General.** This section provides guidance on helicopter air to air refueling (HAAR), hot gas operations and forward area refueling (FARP). It provides parameters used to employ the techniques and procedures of AFTTP 3-3.HC-130. If a discrepancy exists between this instruction and a tactics manual, the information in this instruction will take precedence.

## *Section 18A—Helicopter Air-to-Air Refueling*

**18.2. HAAR Operations (T-1).** HAAR operations will be conducted IAW ATP-56B, AFTTP 3-3.HC-130, the flight manual and the following guidance.

18.2.1. Minimum HAAR Altitudes.

18.2.1.1. Training. Helicopter air refueling will not be conducted below a 1,000 AGL on normal training missions. Waiver authority for HAAR down to 500 feet AGL is the MAJCOM/A3 or deployed equivalent. OG/CCs may request standing waivers for local HAAR tracks and recurring major exercises to be included in their supplement to this instruction. ***NOTE*:** Low altitude HAAR training will not be conducted at tanker gross weights above 130,000 pounds or without three engine climb capability of at least 500 fpm.

18.2.1.2. Contingency/Combat. Plan HAAR altitudes as follows:

18.2.1.2.1. Day Operations: Compute air refueling altitude no lower than 500 feet AGL within 1 NM of the air refueling/flight planned track.

18.2.1.2.2. NVG Operations: Compute air refueling altitude no lower than 500 feet AGL above the highest terrain or obstacle within 3 NM of the air refueling/flight planned track. ***NOTE*:** Refueling altitudes below 1,000 feet AGL may be required due to the threat environment or weather conditions on actual rescues or combat missions. Final refueling altitude is determined by the threat environment, but in no case will it be lower than 300 feet above the receivers' minimum en route altitude capability. ***WARNING*:** Low altitude HAAR (below 1,000 feet AGL) assumes permissive terrain and is not normally possible at night with unaided vision. Large turns or course reversals while refueling below 1,000 feet AGL should be avoided. ***WARNING*:** When operating at or near minimum operating speed, any bank angle could result in a stall without warning.

18.2.2. ATP-56B, Part 3 guidance is supplemented as follows:

18.2.2.1. HC-130 aircrews will not use Rendezvous (RV) Altitudes (AAR altitude + 500') under normal circumstances during rendezvous operations. Tankers will conduct rendezvous and join up operations at refueling altitude (AAR altitude) unless operational requirements dictate otherwise.

18.2.2.2. HC-130 aircrews will not fly RV BRAVO (Head-On) procedures listed.

18.2.2.3. Either the tanker or receiver may initiate/direct a "Breakaway" when an unsafe condition is identified.

***Section 18B—Hot Refueling***

**18.3. General (T-1).** For aircrews, basic hot refueling is the transfer of fuel (refueling or defueling) with one or more engines running at sites where all required equipment is provided. Hot refueling certified Aircrew may refuel/defuel at fixed-sites, refuel/defuel with approved fuel trucks and receive fuel from a fixed-wing tanker at FARP sites. Tanker FARP operations also falls under the hot refueling umbrella and may be performed by FARP certified aircrew. See Section 18C for FARP specific guidance. Aircrews may conduct hot refueling operations under NVG conditions. A comprehensive mission briefing and strict compliance with these procedures will ensure an expeditious and safe refueling operation. The guidance in this section supplements the procedures outlined in TO 00-25-172, AFI 11-235, *Forward Area Refueling Point (FARP) Operations*, AFTTP 3-3.HC-130, and checklists. Request for deviations will be coordinated through HQ ACC/A3J. Prior to conducting hot refueling operations, ensure:

18.3.1. The weapon system and support equipment involved are approved for hot refueling IAW TO 00-25-172.

18.3.2. Air Force hot refueling sites are approved IAW AFI 11-235 or meet the requirements of TO 00-25- 172.

18.3.3. Fire protection equipment is available IAW AFI 11-235 and meets the requirements of TO 00-25-172.

18.3.4. Personnel performing hot refueling operations will have a thorough knowledge of T.O. 00-25-172, specifically section II (Electrostatic Hazards), section III (Bonding), and section VII (Combat or Contingency Operations). Personnel operating refueling equipment during blacked-out operations must be Night Vision Goggle (NVG) qualified.

18.3.5. All Air Force personnel involved with hot refueling operations will be trained IAW *AFI 11-235 FORWARD AREA REFUELING POINT (FARP)OPERATIONS* and appropriate command directives.

18.3.6. Refuel operations at Air Force hot refueling sites will not be conducted within 200 feet of aircraft parking areas, 50 feet of taxing aircraft, and 200 feet of inhabited or uninhabited buildings.

**18.4. Terms.** The following terms are unique to hot refueling operations:

18.4.1. Wet Wing Refueling. Engines not running (power cart, GTC, or APU used). The same checklist and procedures apply as for hot refueling.

18.4.2. Tanker Operations. The act of providing fuel to a receiver source at a hot refueling site.

18.4.3. Receiver Operations. The act of receiving fuel at a hot refueling site.

18.4.4. Fuel Servicing Safety Zone (FSSZ). The area within 50 feet of a pressurized fuel carrying component and 25 feet around fuel vent outlets of an aircraft.

18.4.5. Rearming. The upload of munitions on the receiver aircraft.

**18.5. Planning Factors:** Planners must be aware of factors which limit hot refueling employment and should consider the following when including a hot refueling option in an exercise or contingency:

18.5.1. Passengers. Personnel and equipment may be off-loaded or on-loaded in conjunction with refueling operations. Personnel movement on or off the aircraft should be monitored to maintain accountability in case of an emergency.

18.5.2. Hot refueling sites. Depending on the sister service or host nation there can be several different types of hot refueling sites. Some of the different types of sites are as follows:

18.5.2.1. Forward Area Refueling Equipment (FARE). Forward area refueling equipment sites are normally setup by the Army using blivets to refuel aircraft. Hot refueling qualified crews may conduct refueling /defueling operation at these sites.

18.5.2.2. Forward Area Refueling Point (FARP). Forward area refueling point sites are normally established for aircraft to aircraft refueling. Hot refueling qualified crews may conduct receiver operations at these sites. ***NOTE*:** Refueling trucks may conduct refueling/defueling operations to a single aircraft at FARP sites.

18.5.2.3. Hot Refueling Site. Hot refueling site is a generic term used for a site that refuels/defuels aircraft with engines running from a fixed source or a fuel truck. Hot refueling qualified crews may conduct operations at these sites. ***WARNING***: All hot refueling sites will have a current site survey and meet the minimum unobstructed egress distance required by the survey to ensure the aircraft can taxi from the site in the event of an emergency. If the egress distance is less than the required minimum or the egress area is obstructed, tanker/receiver aircraft will perform refueling/defueling in a cold environment (without engines running) only.

18.5.3. Planners must verify equipment at intended Hot Refueling location is approved for use in hot refueling operations. Refer to T.O. 00-25-172, T.O. 37A9-7-2-1, *Operation, Maintenance, and Illustrated Parts Breakdown—Forward Area Manifold Cart, PN 87940* and the System Safety Engineering Analysis (SSEA) for approved equipment.

**18.6. Crew Duties and Responsibilities. (T-1)** Only current and certified crewmembers will be allowed to occupy a primary crew position on hot refueling missions. ***EXCEPTION:*** Aircrew in certification upgrade may occupy a primary crew position under the supervision of an instructor. Normally these missions will be conducted with a mission crew compliment.

18.6.1. The minimum crew required to conduct hot refueling operations will be as follows:

18.6.1.1. Pilot – 2.

18.6.1.2. Flight engineer – 1.

18.6.1.3. Loadmaster -1. ***NOTE***: The pilot, copilot, and flight engineer will remain on the flight deck in the event of an emergency taxi, i.e. moving the aircraft. These crew positions are the minimum required to fly the aircraft.

18.6.2. Pilot in Command (PIC). The PIC is responsible for the overall safety of the crew and the aircraft hot refueling operations. The PIC relies on the Loadmaster to announce any unusual situations and to recommend the best course of action. The PIC ensures the crew is briefed IAW this instruction prior to commencing hot refueling operations. The aircraft commander will:

18.6.2.1. Ensure approval has been granted by the proper authority prior to conducting hot refueling operations.

18.6.2.2. Ensure all crewmembers are briefed on their specific responsibilities.

18.6.2.3. Analyze runway availability prior to landing to determine braking action. Unnecessary or heavy braking could delay hot refueling operations.

18.6.2.4. Analyze planned hot refueling area for hazards and sufficient taxi clearances.

18.6.2.5. Determine fuel requirements to include estimated onload and offload.

18.6.3. Flight engineer (FE): The flight engineer will:

18.6.3.1. Read and ensure compliance with the hot refueling checklist.

18.6.3.2. Control fuel distribution and the SPR drain pump on UARRSI modified aircraft.

18.6.3.3. Coordinate fuel distribution with the loadmaster on Non-UARRSI aircraft.

18.6.4. Loadmaster (LM). The LM is responsible for supervising fuel servicing operations. The loadmaster will:

18.6.4.1. Ensure compliance with all safety procedures.

18.6.4.2. Immediately inform the pilot and advise the crew on recommended course of action, in the event of a hazardous situation/emergency.

18.6.4.3. Ensure all required equipment is on board prior to and after hot refueling operations.

18.6.4.4. Operate the ramp and door or paratroop door as required.

18.6.4.5. Complete the hot brake/hung flare check prior to commencing hot refueling operations.

18.6.4.6. Ensures that all personnel are properly briefed on fueling procedures.

18.6.4.7. Operate the SPR panel and control fuel distribution with coordination from the flight engineer. ***EXCEPTION***: On UARRSI modified aircraft the flight engineer will control fuel distribution.

18.6.4.8. Perform leak check at SPR panel.

18.6.4.9. Secure aircraft for departure after all equipment and personnel are aboard.

**18.7. Hot Refueling Equipment (T-1).** The hot refueling mission requires specific equipment and inspections prior to commencing operations. Only equipment approved IAW TO 00-25-172, TO 37A9-7-2-1, and in the system safety engineering analysis (SSEA) shall be used. This equipment is unique in that it provides for an internal bond that is not provided for with conventional refueling equipment. If unapproved equipment is used, the refueling operation must be accomplished without engines running.

18.7.1. Those personnel who will have direct contact with fueling operations during hot refueling will have the following:

18.7.1.1. Spare flight gloves.

18.7.1.2. Extra flight suit or change of clothing, including flight boots.

18.7.1.3. Full canteen, to be carried on your person.

18.7.1.4. Sealable water and fuel resistant garment bag to store fuel soaked clothing.

18.7.1.5. NVGs with spare battery (as required).

18.7.1.6. Dust goggles (as required).

18.7.1.7. Survival vest (as required).

18.7.1.8. Overt/IR chemlights (as required).

18.7.1.9. IR compatible flashlight (as required).

18.7.1.10. Cloth Tape - For NVG operations, position sufficient layers of cloth tape on the refueling panel light. For those aircraft so equipped, tape the dump pump light as well. Taping these lights is required to reduce the amount of light, not to eliminate the light (Not required for NVIS modified aircraft).

**18.8. Weather Requirements (T-1).** For training operations and exercises, stop fuel servicing when high winds or reduced visibility caused by blowing rain, snow, or sand exists or when an electrical storm is within a 5 mile radius of the hot refueling site. Contact the local weather agency for observations and/or forecasts for potential mission impacting weather phenomena.

**18.9. Safety (T-1).** Because of the inherent dangers with the ground refueling and rearming of aircraft, safety cannot be overemphasized. Safety is the responsibility of all personnel and is considered before, during, and after all refueling operations. Any person observing an unsafe situation, practice, or procedure should immediately inform all personnel, and all refueling and rearming operations will immediately stop until the unsafe condition can be eliminated.

18.9.1. Safety guidance. Hot refueling aircraft have been tailored to perform this unique and risky operation. Each aircraft and the refueling equipment involved in the operation was subjected to a System Safety Engineering Analysis (SSEA), which includes; a failure mode/effects criticality assessments, and operating/support hazard analysis. This process considers the weapon system, support equipment and the personnel interface. Overall, the system safety approach minimizes the hazards associated with this operation, reducing them to an acceptable level.

18.9.1.1. Electrostatic discharge. Energy levels associated with electrostatic discharge are several times the energy required to ignite fuel vapors. A charge of static electricity can accumulate from fuel flowing through piping, hoses, couplers, and nozzles. Operating aircraft engines, rotor blades, and propeller blades also generate high static electricity voltages. The normal activity of personnel involved in refueling operations can generate static electricity on their clothing. Humidity greatly affects static electricity characteristics, the lower the humidity, the higher electrostatic potential. Under low humidity conditions, flight suits can produce a static charge of sufficient potential to cause a discharge. Anti-static finishes are not permanent and are gradually removed by laundering or dry cleaning. In addition, anti-static finishes are not effective in low humidity conditions or at low temperatures. To equalize these charges and reduce the possibility of sparks, aircraft and refueling equipment are bonded to each other. The electrical bonding of refueling servicing equipment and aircraft is a critical item because aircraft are not normally grounded for this operation.

18.9.1.2. If a ground is not available at a FOL or remote site, aircraft will be bonded to servicing equipment during actual servicing. Bonding will be accomplished by inserting the bonding plug into the receiver aircraft's external receptacle prior to any other action.

18.9.1.3. In the event of static discharge, forward the following data to HQ ACC/A3TW following all hot refueling operations: type aircraft involved, OAT, dew point, humidity, engines running / low speed / shutdown, taxiway / runway surface, indication of discharge, and sequence followed when bonding / grounding.

18.9.2. Fire Protection. Fire protection equipment is available IAW **paragraph 18.3.3** Personnel involved in servicing operations will be trained in portable fire extinguishers and installed equipment fire suppression system operations.

18.9.3. Heat exhaustion and carbon monoxide inhalation. Heat exhaustion and carbon monoxide inhalation, although not serious problems are two factors that can affect a crews ability to perform at their peak. You can suffer heat exhaustion or minor burns from the heat of the engines combined with wind conditions. You may also inhale carbon monoxide from the engine exhausts. The following are suggestions of how to minimize the effects of heat and carbon monoxide if the tactical situation will permit:

18.9.3.1. Keep drinking water available, and drink large quantities of water to help prevent dehydration.

18.9.3.2. Raising the aircraft flaps may reduce the exhaust being placed on the loadmaster. Using the aircraft engine oil cooler augmentation (if available) may reduce the exhaust behind the aircraft. Wind direction, temperature, location and environment are all factors to be considered.

18.9.4. Uses of 100 percent nylon garments. The wear of Gortex ® or equivalent (The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force) is authorized for aircraft servicing with JP-5/8/10, Jet-A, and diesel fuel (including mixed fuel criteria). Personnel will not wear Gortex within 50-feet when servicing aircraft with JP-4 or ground servicing with mobility gas (MOGAS).

18.9.5. General Ordnance Procedures. Aircraft may be hot refueled with live ordnance aboard, however upload/download of ordnance and refueling of aircraft will normally be conducted as separate operations; a separate area should be established at least 300 feet from the hot refueling site. During combat or contingency operations, concurrent refueling and upload/download of ordnance may be authorized when, in the judgment of the mission commander, operational necessity and benefits of reducing ground time outweigh the risks involved.

**18.10. Electronic Emissions:**

18.10.1. Inertial navigational systems (INS or INU) may remain energized.

18.10.2. Restrictions:

18.10.2.1. Radar, radar altimeters, Doppler or DVS, and ECM equipment will not be operated within the refueling area.

18.10.2.2. Any hand-held radios used within the FSSZ must be intrinsically safe.

18.10.2.3. HF radio transmissions are not allowed within the FSSZ during refueling operations.

18.10.3. Internal Communications. During ground operations, communications can be difficult due to aircraft noise levels. Interphone discipline is essential so emergency calls may be relayed clearly. ***NOTE:*** All unnecessary voice communication is prohibited for safety reasons. Voice communication contact between the loadmaster and cockpit will be maintained at all times. ***EXCEPTION:*** The loadmaster does not have to maintain interphone contact while positioning/repositioning refueling equipment, but will be on interphone any time the refueling nozzle is connected to the aircraft and the switches on the SPR panel are in a position other than off or closed.

**18.11. Aircraft Marshaling: (T-1)**

18.11.1. When CCT/STS are responsible for primary air traffic control of an airfield, they will marshal and control all aircraft movement into the hot refueling site. If CCT/STS are not available, all aircraft are responsible for self-marshaling into the hot refueling site.

18.11.2. Aircraft commanders must ensure marshaling procedures are thoroughly prebriefed between all agencies involved prior to hot refueling operations. These procedures must be strictly adhered to at all times, to ensure all safety requirements are met.

**18.12. Emergency Procedures. (T-1)** Hot Refueling/FARP Emergency procedures are published in the amplified checklist and abbreviated checklist. They will be reviewed by all crewmembers and briefed by the PIC prior to commencing hot refueling operations. All personnel, including ground controllers, will know the ground evacuation plans. Stop all hot refueling operations immediately when a leak, unsafe condition, or system malfunction occurs. Correct the deficiency before resuming hot refueling operations.

**18.13. Checklists.** Amplified HOT REFUELING/FARP Checklists are published in **Attachment 4**. Checklists are applicable to those aircraft equipped with and without the UARRSI modification. Items (i.e. aircraft systems, checklist items, crew positions) in the checklist which are not applicable to a unit's particular weapon system may be lined out in pencil.

***Section 18C—FARP Specific Guidance***

**18.14. Forward Area Refueling Point (FARP).** The following paragraphs provide general guidelines for HC-130 FARP operations, in preplanned and contingency operations. The HC-130 can conduct single point FARP operations. The scope of flight operations in the FARP area should include, but not be limited to individual aircraft, sections, or divisions of aircraft requiring refueling. The guidance in this section supplements the procedures in TO 00-25-172, *Ground Servicing and Static Grounding/Bonding*; TO 37A9-7-2-1, *Operations Maintenance and Illustrated Parts Breakdown FAM Cart*; AFI 11-235, *Forward Area Refueling Point Operations*; and AFFTP 3-3.HC-130. All guidance and restrictions applicable to Hot Refueling are applicable to FARP, unless stated otherwise in this AFI or other referenced publications. Deviations from the procedures contained in this chapter must be approved by MAJCOM/A3.

18.14.1. Forward Area Refueling Point (FARP) is a tactical aircraft-to-aircraft ground refueling operation that can be performed by HC-130 with engines running to a fixed-/rotary-wing aircraft or fuel bladders/vehicles. FARP may be used to extend the combat radius/loiter time of receiver aircraft. FARP is normally conducted at night in austere environments with engines running and includes fuel transfer from aircraft wing/fuselage tanks through the single-point refueling panel to receiver fixed or rotary-wing aircraft single point refueling panel (if applicable). All equipment and personnel required to set-up the FARP site are assigned to the tanker aircraft.

18.14.2. Ensure the FARP site is approved IAW AFI 11-235, Forward Area Refueling Point Operations*, and meets the requirements of TO 00-25-172,* Ground Servicing and Static Grounding/Bonding.

18.14.3. Ensure all Air Force personnel involved are trained IAW approved IAW AFI 11-235, Forward Area Refueling Point Operations and appropriate command directives.

18.14.4. **Maintenance of FARP Equipment for ACC Units.** Refer to AFI 11-235 and T.O. 37A9-7-2-1.

**18.15. FARP Crew Complement (T-1).** Only certified and current crewmembers will occupy a primary crew position during FARP operations. ***EXCEPTION***: Crewmembers in training under the supervision of a current and qualified instructor. Normally these missions will be conducted with a NVG tactical/operational crew. The minimum crew required to deploy and operate a FARP will be as follows:

18.15.1. Pilot – 2 (only the PIC is required to be FARP certified)

18.15.2. Flight engineer – 1

18.15.3. Navigator – 1

18.15.4. Hot Refueling Supervisor (Loadmaster) – 1

18.15.5. Panel Operator (Loadmaster) 1

18.15.6. Hose Deployment Personnel (2FOXl/AMSS/ Loadmaster) - one per refueling point

**18.16. Crew Duties and Responsibilities (T-1).** ***NOTE:*** The pilot, copilot, and flight engineer will remain on the flight deck in the event of an emergency taxi, i.e. moving the aircraft. Amplified HOT REFUELING/FARP Checklists are published in **Attachment 4**.

18.16.1. **Hose Deployment Personnel (HDP). (T-1)** Properly trained Aircrew AMSS or Loadmasters will perform HDP in lieu of Air Force fuels personnel (AFSC 2FOXl) and will be included in the FARP to deploy/redeploy fuel hoses. Minimum HDPs will be one person for each receiver point. The personnel designated as HDPs will deploy hoses from the aircraft and set up the refueling points. ***WARNING:*** HDPs (2FOXl) will not be used to marshal aircraft. ***NOTE:*** For the HC-130 to conduct FARP operations without an HDP trained USAF fuels personnel (AFSC 2FOXI) as part of the crew compliment, the receiver aircraft must deplane a crew member to connect the refueling nozzle and refuel the aircraft. LM and AMSS certified as HDP are not authorized to perform these duties.

18.16.2. **Hot Refueling Supervisor (HRS) Duties (T-1)**:

18.16.2.1. The HRS is responsible for supervising fuel servicing operations.

18.16.2.2. Ensures that all personnel are properly briefed on fueling procedures.

18.16.2.3. Has a thorough knowledge of all equipment and systems and how they operate. HRS will also be PO certified.

18.16.2.4. Has a thorough knowledge of and observes all safety procedures.

18.16.2.5. Has a thorough knowledge of and follows the sequential steps for each operation.

18.16.2.6. The HRS will brief who will operate the ramp and door, paratroop door, and canary slides/ground loading ramps. The HRS, upon landing and after clearance from the pilot, will open the cargo ramp and door to 12 inches above horizontal position. Upon clearance from the pilot to offload the HRS will lower the cargo ramp to the ground. The HRS will exit the aircraft through the ramp and door to perform the hot brake /hung flare checks and to clear personnel off the aircraft to establish the FARP site. ***NOTE:*** During hose deployment, the HRS will assist the HDP deploying the hoses.

18.16.2.7. Instructs the PO when to dispense or shutoff fuel flow by interphone or hand signals, monitors for fuel leaks and periodically scans the tanker wings. The HRS will be positioned so as to have an unobstructed view of the entire operation.

18.16.2.8. In the event of a hazardous situation/emergency, the HRS will immediately inform the pilot and advise the crew on recommended course of action.

18.16.2.9. The HRS assists with the tear down of the FARP equipment upon completion, the PO will assumes primary interphone contact.

18.16.3. **Panel Operator (PO) (Tanker operations) duties (T-1):**

18.16.3.1. Will operate the SPR panel. The flight engineer will control the fuel distribution by use of dump pumps. The PO will also be HRS qualified.

18.16.3.2. The PO will open the right paratroop door.

18.16.3.3. The PO will position an inter-phone cord near the right paratroop door.

18.16.3.4. Upon clearance from the HRS, the PO and HDP will exit the aircraft and deploy the tanker end of the refueling hose towards the SPR panel. ***WARNING:*** Bonding will be accomplished by inserting the bonding plug from the refueling nozzle into the aircraft's external receptacle prior to any other action.

18.16.3.5. The PO connects the SPR nozzle to the SPR receptacle IAW applicable directives, and monitors the refueling hose to prevent HDP from possibly damaging the hose/connector. Once hose layout is complete, position fire extinguisher and water container next to the SPR panel. The PO connects to the prepositioned inter-phone cord.

18.16.3.6. The right paratroop door will remain open during hot refueling operations. ***CAUTION:*** In the event the aircraft must depart immediately, the PO will shut down the SPR panel using the offload valve only and disconnect the SPR nozzle.

18.16.3.7. Perform leak check at SPR panel.

18.16.3.8. The PO assumes primary interphone contact when the HRS assists the HDPs in evacuating hoses/tear down.

18.16.3.9. To drain the residual fuel from the refueling hoses, pressure will be relieved from the refueling hose IAW applicable directives.

18.16.3.10. Setup the SPR panel IAW this AFI. ***EXCEPTION***: On UARRSI modified aircraft the FE will control the SPR drain pump.

18.16.3.11. After all hoses have been rolled/stowed to the low (suction) side of the pump, turn the pump off and disconnect the hose. The 10' section can be evacuated by use of the SPR drain pump and holding the hose overhead. Some residual fuel will remain in this section of hose. The PO turns off the refueling panel and disconnects the SPR nozzle.

18.16.3.12. Secure aircraft for departure after all equipment and personnel are aboard.

**18.17. Hose Deployment from FARP sled or Aircraft Floor/Ramp. (T-1) *WARNING*:** Refueling hoses will only be pulled from over the shoulder while running/walking forward, not backwards. ***CAUTION:*** While deploying hoses, after sufficient resistance is met, lay down hoses and return to the aircraft for another length. Repeat this step as necessary until positioning is complete. Minimize the dragging of connections/valves to prevent damage.

18.17.1. HDP/HRSs will walk the length of the hoses back to the aircraft checking for kinks, twists, and dry break positions.

18.17.2. After walking the hoses, the HDPs will notify the HRS with a thumbs up signal that the line check is complete. HDPs will return to the aircraft for the fire extinguishers and water containers and return to the refueling nozzle end. Position a fire extinguisher at the refueling point. Position water canister at 200' dry break connection. The HDP will wait for fuel pressurization to the points.

18.17.3. When the hoses are pressurized, perform leak check.

18.17.4. HDPs will remain at the refueling point to act as fire guard after passing the refueling nozzle to the receiver crewmember. ***WARNING***: HDPs will not be used to marshal aircraft IAW AFI 11-235. ***WARNING*:** Bonding will be accomplished by inserting the bonding plug from the refueling nozzle into the aircraft's external receptacle prior to any other action.

18.17.5. After the completion of FARP, the HDPs will position themselves at the refueling point to drain the hose. Stretch hoses to their full length, starting at the receiver SPR/CCR nozzle, and attach the squeegee, to squeegee that segment of hose. After squeeging the length of hose and reaching a connection, evacuate fuel from hose by briefly opening the valve, then close both sides of the valve and disconnect hose. Install dust caps. Stow/Roll that segment of hose. Repeat steps for each section of hose. Return hoses to the FARP sled or aircraft floor. ***NOTE:*** Squeegees should be used to drain hoses. When squeegees are not available, walking and rolling the hoses will suffice as an alternate method of draining. This alternate method will leave more residual fuel in the hoses and will increase tear down time. When reaching the fittings, raise the hose and let fuel drain from the fitting into the next hose, close both valves while in raised position.

18.17.6. Two personnel are required to drain each section of hose. One installs and pulls the squeegee, and the other holds the hose. The person holding the hose will then start rolling the hose.

**18.18. Typical Single Point FARP Configuration. (T-1)** The single point FARP set-up will be configured on the aircraft ramp for ease and rapid deployment. Required support/safety equipment will be configured near the right paratroop door for convenient access by the PO. See **Figures 18.1** and **18.2** for typical set-up. ***NOTE:*** FARP equipment weights are contained in AFI 11-2HC-130V3, Addenda A.

**Figure 18.1. Support/Safety Equipment Restrained Near Right Paratroop Door.**

**Figure 18.2. FARP Basket with Rigged Equipment on Cargo Ramp.**

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Deputy Chief of Staff for Operations

## Attachment 1

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***Abbreviations and Acronyms***

**AC**—Aircraft Commander

**AF**—Air Force

**AFI**—Air Force Instruction

**AFCS**—Automated Flight Control System

**AFRC**—Air Force Reserve Command

**AFRIMS**—Air Force Records Information Management System

**AFTTP**—Air Force Tactics, Techniques, and Procedures

**ARC**—Air Reserve Component or Advanced Rescue Craft

**ARCP**—Air Refueling Control Point

**ARCT**—Air Refueling Control Time

**ATC**—Air Traffic Control

**ATV**—All-Terrain Vehicle

**BAI**—Back-up Aircraft Inventory

**CARP**—Computed Air Release Point

**CCC**—Command Control Center

**CCT**—Combat Control Team

**CDS**—Container Delivery System

**CRL**—Container Ramp Load

**CRS**—Container Recovery System

**DRU**—Direct Reporting Agency

**DZC**—Drop Zone Controller

**ECM**—Electronic Counter Measures

**ETP**—Equal Time Point

**FARP**—Forward Area Refueling Point

**FCIF**—Flight Crew Information File

**HAHO**—High-Altitude High Opening

**HALO**—High-Altitude Low Opening

**HAAR**—Helicopter Air-to-Air Refueling

**IAW**—In Accordance With

**ICAO**—International Civil Aviation Organization

**IFR**—Instrument Flight Rules

**ILS**—Instrument Landing System

**IMC**—Instrument Meteorological Conditions

**INS**—Inertial Navigation System

**IP**—Instructor Pilot or Initial Point

**LPU**—Life Preserver Unit

**LZC**—Landing Zone Control

**MARSA**—Military Assume Responsibility for Separation Aircraft

**MCAD**—Mission Computer Airdrop

**MEA**—Minimum Enroute Altitude

**MEP**—Mission Essential Personnel

**MDA**—Minimum Descent Altitude

**MDS**—Mission Design Series

**MFF**—Military Free Fall

**NVG**—Night Vision Goggle

**OPCON**—Operational Control

**OPORD**—Operational Order

**OPR**—Office of Primary Responsibility

**PAR**—Precision Approach Radar

**PI**—Point of Impact

**RAMZ**—Rigging, Alternate Method, Zodiac

**RCL**—Reception Committee Light

**RM**—Risk Management

**SATB**—Standard Airdrop Training Bundle

**SCA**—Self-Contained Approach

**SCNS**—Self-Contained Navigation System

**SNS**—Satellite Navigation Station

**STS**—Special Tactics Squadron

**SSEA**—System Safety Engineering Analysis

**T.O.**—Technical Order

**TOT**—Time Over Target

**UHF**—Ultra High Frquency

**VIP**—Very Important Person

**VHF**—Very High Frequency

**VMC**—Visual Meteorological Conditions

***Terms***

**AFKAI-()**—Contains the worldwide USAF voice call sign list and the specific assignment of each to USAF, JCS, Army, Navy, unified and specified commands, and certain Executive, State Department, and DOD activities.

**Airborne Mission Coordinator (AMC)**—The primary role of any AMC is to serve as an extension of the component commander or supported commander responsible for the PR mission, through the personnel recovery task force (PRTF) commander. The desired AMC aircraft is an airborne platform with the best combination of on-station time and organic communications capability.

**Aircraft Commander (AC)**—A qualified pilot graduate of an aircraft commander upgrade course or aircraft commander initial qualification training, certified by the squadron commander to act as pilot in command of an aircraft. Capable of holding the A-code.

**Air Refueling (AR)**—Airborne fuel onload by receiver aircraft.

**Air Refueling Control Point (ARCP)**—The planned geographic point over which the receiver arrives in the precontact position with respect to the assigned tanker. For Helo AR, the planned geographic point or coordinates over which the tanker arrives abeam the receiver and assumes formation lead.

**Air Refueling Control Time (ARCT)**—The planned time that the receiver and tanker will arrive over the ARCP.

**Air Reserve Components (ARC)**—Refers to Air National Guard and AFRC forces, both Associate and Unit Equipped.

**Assault Landing Zone (ALZ)**—A paved or semiprepared (unpaved) airfield used to conduct operations in an airfield environment similar to forward operating locations. ALZ runways are typically shorter and narrower than standard runways. For training, main runways may be used to simulate assault landing zones (i.e. painted markings).

**Augmented Crew**—Basic aircrew supplemented by additional qualified aircrew members to permit in-flight rest periods.

**Automated flight planning System(s)**—MAJCOM-certified, computer software used for flight/mission planning (i.e. PFPS).

**Bird Condition Low**— Bird Watch Condition LOW. Bird activity on and around the airfield representing low potential for strikes. List restrictions in local Chapter 10.

**Bird Condition Moderate**—Bird Watch Condition MODERATE. Bird activity near the active runway or other specific location representing increased potential for strikes. BWC moderate requires increased vigilance by all agencies and supervisors, and caution by aircrews. List restrictions in local Chapter 10.

**Bird Condition Severe**—Bird Watch Condition SEVERE. Bird activity on or immediately above the active runway or other specific location representing high potential for strikes. Supervisors and aircrews must thoroughly evaluate mission need before conducting operations in areas under condition SEVERE. List restrictions in local Chapter 10.

**Block Time**—Time determined by the scheduling agency responsible for mission accomplishment for the aircraft to arrive at (block in) or depart from (block out) the parking spot.

**Border Clearance**—Those clearances and inspections required to comply with federal, state, and local agricultural, customs, immigration, and immunization requirements.

**Category I Route**—Any route that does not meet the requirements of a category II route.

**Category II Route**—Any route on which the position of the aircraft can be accurately determined by the overhead crossing of a radio aid (NDB, VOR, TACAN) at least once each hour with positive course guidance between such radio aids.

**Chalk Number**—A number used to identify and designate an aircraft's position for loading and unloading.

**Change of Operational Control (CHOP)**—The change of operational control of forces as outlined in applicable tasking directives.

**Circular Error Average (CEA)**—Indicator of accuracy of an airdrop operation. It is the radius of a circle within which half of the airdropped personnel and items or materiels have fallen.

**Combat Control Team (CCT)**—A small task organized team of Air Force parachute and combat diver qualified personnel trained and equipped to rapidly establish and control drop, landing, and extraction zone air traffic in austere or hostile conditions. They survey and establish terminal airheads as well as provide guidance to aircraft for airlift operations. They provide command and control, and conduct reconnaissance, surveillance, and survey assessments of potential objective airfields or assault zones. They also can perform limited weather observations and removal of obstacles or unexploded ordinance with demolitions.

**Combat Entry Point**—A geographical point inbound to the objective area where the hostile environment is penetrated.

**Combat Offload**—Method by which palletized cargo is offloaded without Materials Handling Equipment (MHE).

**Command and Control (C2)**—The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission.

**Command and Control Center (CCC)**—An agency used by a commander to plan, direct, or control operations. Each CCC provides supervision, guidance, and control within its assigned area of responsibility. For the purpose of this volume, CCCs include the ACC or respective command center, AMC Command Center, Command Post (CP), Air Mobility Elements (AME), Airlift Coordination Centers, Combat Control Teams (CCT), AFRC Headquarters Command Post (HQ AFRC CP), National Guard Command Center (NGCC), and ARC wing or group operations centers and command posts.

**Computed Air Release Point (CARP)**—A computed air position at which the release of personnel, equipment, containers, and bundles is initiated to land on a specific point of impact (PI).

**Conference HOTEL**—The name of the communication conference available to assist aircrews in coping with in-flight emergencies and conditions that require expertise in addition to that available on board the aircraft.

**Contingency Mission**—A mission operated in direct support of an operation plan, operation order, disaster, or emergency.

**Deadhead Time**—Duty time accrued by crewmembers in a passenger or additional crewmember status.

**Drop Zone (DZ)**—A specified area upon which airborne troops, equipment, or supplies are airdropped.

**Drop Zone Controller (DZC)**—An individual on a drop zone required to monitor all airdrop operations except airdrop of Special Forces.

**Drop Zone Entry Point**—A fixed point on DZ run-in course where an aircraft may safely begin descent from IFR enroute altitude to IFR drop altitude. The DZ entry point is a maximum of 40 NM prior to the DZ exit point according to Federal Aviation Administration FAR exemption 4371C.

**Drop Zone Exit Point**—A fixed point on the DZ escape flight path centerline, established during pre-mission planning, at which the aircraft will be at the minimum IFR enroute altitude. Calculate the exit point based upon three-engine performance at airdrop gross weight. This point will be planned no less than four NMs track distance beyond the DZ trailing edge.

**Due Regard**—Operational situations that do not lend themselves to International Civil Aviation Organization (ICAO) flight procedures, such as military contingencies, classified missions, politically sensitive missions, or training activities. Flight under Due Regard obligates the military aircraft commander to be his or her own air traffic control agency and to separate his or her aircraft from all other air traffic. (See FLIP General Planning)

**Element**—A subdivision (normally three aircraft) flying in formation.

**Equal Time Point (ETP)**—The point along a route at which an aircraft may either proceed to the first suitable airport or return to the last suitable airport in the same amount of time based on all engines operating (see **Chapter 11**).

**Hazardous Cargo or Materials**—Explosive, toxic, caustic, nuclear, combustible, flammable, biologically infectious, or poisonous materials that may directly endanger human life or property, particularly if misused, mishandled or involved in accidents (AFJI 11-204, AFMAN 24-204, TO 11N-20-11).

**Helicopter Air-to-Air Refueling (HAAR)**—Airborne fuel offload by HC-130 aircraft to a helicopter.

**High Altitude High Opening (HAHO)**—A high altitude airdrop in which personnel deploy their parachutes immediately on exiting the aircraft (no programmed free fall).

**High Altitude Low Opening (HALO)**—Airdrop of personnel or containers using a programmed free fall (parachutist) or a staged parachute delivery.

**High Altitude Release Point (HARP)**—A computed air position at which parachutists, equipment, containers, or bundles are released to land on a specific point of impact. A HARP is computed for all HAHO and HALO drops.

**Home Station**—Home bases of assignment for aircraft.

**Initial Point (IP)**—A point near drop zones or landing zones over which final course alterations are made to arrive at the specified zone.

**Interfly**—Intermixing of crewmembers from different units in the same aircrew or unit aircrews flying aircraft assigned to another unit.

**Live Ordnance**—Combat type ordnance incorporating explosive or incendiary material to include flares.

**Load Message**—An operational immediate message electronically transmitted from departure station listing pertinent traffic and operational data.

**Local Training Mission**—A mission scheduled to originate and terminate at home station (or an off-station training mission), generated for training or evaluation, and executed at the local level.

**Low Level**—Operations conducted below 3,000 feet AGL.

**Maintenance Codes**—Fully Mission Capable (FMC), Partially Mission Capable (PMC), Not Mission Capable (NMC)

+ M (Maintenance), + S (Supply), + B (Both)

**Military Authority Assumes Responsibility for Separation of Aircraft (MARSA)**—A condition whereby the military services involved assume responsibility for separation between participating aircraft in the air traffic control (ATC) system.

**Military Free Fall**—An employment concept encompassing both high altitude low opening and high altitude high opening techniques of parachuting.

**Minimum Safe Altitude (MSA)**—MSA is an intermediate altitude which will provide terrain clearance in VMC or IMC.

**Mission Capable**—Crews or crewmembers qualified and current to perform some portion of the unit mission, but who do not maintain mission ready status.

**Mission Essential Personnel**—Personnel who are required for the execution of the aircraft or unit mission and personnel not authorized AOs tasked to perform unique ground support duties at an en route location or destination point that are directly related and essential to accomplishment of the aircraft or unit mission may fly as Mission Essential Personnel.

**Mission Ready**—Crews or crewmembers fully qualified and current to perform the unit mission.

**Night**—The time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time. (ref AFI 11-202, Volume 3, *General Flight Rules*)

**Offset Aiming Point (OAP)**—A reference, other than the actual target, used for aircraft positioning.

**On-Scene Commander (OSC)**—The individual who initiates rescue efforts in the objective area until rescue forces arrive. Initially, the OSC may be any aircraft in the vicinity, including the wingman of a downed aircraft.

**Operational Control**—Command authority that may be exercised by commanders at any echelon at or below the level of combatant command. Operational control is inherent in combatant command (command authority) and may be delegated within the command. When forces are transferred between combatant commands, the command relationship the gaining commander will exercise (and the losing commander will relinquish) over these forces must be specified by the Secretary of Defense. Operational control is the authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission.

**Operational Missions**—Missions such as contingency/deployment, re-deployment, actual SAR operations and JA/ATT missions are considered operational missions.

**Overwater Flight**— Any flight that exceeds power off gliding distance from land.

**Pararescue/Jumper Minimum Operating Speed (PJ MOS)**—A minimum operating speed computed for all static line airdrops.

**Patient Movement Categories: Urgent**—Patients who must be moved immediately to save life, limb, or eyesight, or to prevent complication of a serious illness. **Priority** – Patients requiring prompt medical care who must be moved within 24 hours. **Routine** – Patients who should be picked up within 72 hours and moved on routine/scheduled flights.

**Permit to Proceed**—Aircraft not cleared at the first US port of entry may move to another US airport on a permit to proceed issued by customs officials at the first port of entry. The permit lists the requirements to be met at the next point of landing, i.e., number of crew and passengers, cargo not yet cleared. Aircraft commanders are responsible to deliver the permit to proceed to the customs inspector at the base where final clearance is performed. (Heavy monetary fines can be imposed on the aircraft commander for not complying with permit to proceed procedures.)

**Pilot In Command**—The aircraft commander, instructor pilot, or evaluator pilot designated on the flight authorization to act in command of a particular flight, or flights. Normally denoted by the A-code remark on the applicable flight authorization.

**Point of Impact (PI)**—The point on the drop zone where the first airdropped parachutist or cargo item lands or is expected to land.

**Quick Turn**—A set of procedures designed to expedite the movement of selected missions by reducing ground times at en route or turnaround stations.

**Rescue Mission Commander (RMC)**—The RMC is the individual designated to control recovery efforts in the objective area, as opposed to an OSC who may be first on scene but is not necessarily best qualified to lead and coordinate the recovery execution. The RMC is designated through the JPRC, or by the component commander through the PRCC.

**Risk Management (RM)**— RM is a decision-making process to systematically evaluate possible courses of action, identify risks and benefits, and determine the best course of action (COA) for any given situation. RM enables commanders, functional managers, supervisors, and individuals to maximize capabilities while limiting risks through application of a simple, systematic process appropriate for all personnel and functions in both on- and off-duty situations. Appropriate use of RM increases an organization's and individual's ability to safely and effectively accomplish their mission/activity while preserving lives and precious resources.

**Self-Contained Approach (SCA)**—An approach procedure conducted using self-contained, onboard navigation systems.

**Self-Contained Departure (SCD)**—A departure conducted using self-contained, onboard navigation systems.

**Significant Meteorological Information (SIGMET)**—Area weather advisory issued by an ICAO meteorological office relayed to and broadcast by the applicable ATC agency. SIGMET advisories are issued for tornadoes, lines of thunderstorms, embedded thunderstorms, large hail, severe and extreme turbulence, severe icing, and widespread dust or sand storms. SIGMETs frequently cover a large geographical area and vertical thickness. They are prepared for general aviation and may not consider aircraft type or capability.

**Special Tactics Team (STT)**—A task-organized element of special tactics that may include combat control, pararescue, and special operations weather team (SOWT) personnel. Functions include austere airfield and assault zone reconnaissance, surveillance, establishment, and terminal control; terminal attack control; combat search and rescue; combat casualty care and evacuation staging; and tactical weather observations and forecasting.

**Station Time (Air Force)**—A specified time at which aircrew, passengers, and material are to be in the aircraft and prepared for flight. Passengers will be seated and loads tied down. Aircrews will have completed briefing and aircraft preflight inspection prior to station time. Normally, station time will be 30 minutes prior to takeoff time.

**Station Time (Airborne)**—A specified time when parachutists will be seated in the aircraft with seat belts fastened. This time normally will be 5 minutes prior to Air Force station time.

**Suitable Airfield**—Normally, suitable airfields are those which meet weather, fuel, and runway requirements and are within 100 NM of flight plan course centerline.

**Tactical Control (TACON)**—Command authority over assigned or attached forces or commands, or military capability or forces made available for tasking, that is limited to the detailed and, usually, local direction and control of movements or maneuvers necessary to accomplish missions or tasks assigned. Tactical control is inherent to OPCON. Tactical control may be delegated to and exercised at any level at or below the level of combatant command.

**Threat Penetration Altitude**— An altitude flow to delay or defeat enemy detection and engagement by minimizing the time spent in the enemy's threat envelope. For low level operations, it is an altitude below the normal modified contour LAA.

**Time Out**—Common assertive statement used to voice crewmember concern when safety may be jeopardized.

**Time Over Target (TOT)**—The actual time an aircraft is at a geographic point or area carrying out an assigned mission.

**Training Mission**—Mission executed at the unit level for the sole purpose of aircrew training for upgrade or proficiency. This does not include operational missions as defined in this instruction.

**Unilateral**—Operations confined to a single service.

**Unit Move**—Mission airlifting military passengers or troops who originate from the same unit and onload point, are under the control of a designated troop commander, and offload at the same destination.

## Attachment 2

## TACTICAL AIRDROP CHECKLISTS

**A2.1. Airdrop General. (T-1)** Prior to takeoff, the pilot will ensure the crew has thoroughly reviewed all airdrop emergency procedures. Loadmasters will thoroughly pre-brief verbal/visual signals and establish coordinated task prior to the first airdrop warning.

***WARNING:*** **(T-1)** If any person experiences decompression sickness or unusual pain follow the high altitude emergency procedures. See **Chapter 17.**

***CAUTION:*** **(T-1)** For high altitude airdrops, do not pressurize cabin altitude below the set parachute activation altitude until all parachutes have been de-armed.

***NOTE:*** **(T-1)** Twenty and Ten-Minute Checklist May be completed early at the discretion of the aircraft commander.
***NOTE:*** Items marked by an asterisk "*****" are steps specific to JPADS (Guided/Improved) deployments.

**A2.2. Precision Airdrop System (PADS) Operator (PO) Preflight Checklist. (T-1)** This checklist will be completed by the Navigator or designated PO prior to all dropsonde or guide airdrops missions.

**PADS OPERATOR PREFLIGHT CHECKLIST**

1. Aircraft UHF Radios and GPS – On

2. JPADS-MP and UHF-DRS – Connected

***NOTE:*** There are two cables, the Ethernet cable and the power cable. Ensure both the computer and the UHF-DRS are OFF before you connect them.

3. UHF-DRS and GPS-RTS – On

***NOTE:*** Ensure the aircraft GPS has a valid GPS position (4 satellites) for the light to switch to steady after 5 minutes.

***NOTE:*** (T-2) If the GPS-RTS does not receive a valid GPS fix within the first 5 minutes, it will continue to blink even if a valid GPS fix is established.

***NOTE:*** A UHF-DRS flashing Ethernet light indicates the system is complete with its bit and ready for operation.

4. Load Weights - Verified

5. Load Positions – Verified

6. Chute Type – Verified

7. Dropsonde Frequencies (If required) – Verified

8. Dropsonde ID (If required) – Recorded

9. Mission Log – Updated

10. Autonomous Guidance Units (AGU) (If required) – On

11. AGU(s) Communication ID (If required) – Recorded

***NOTE:*** Record entire communication ID for each AGU.

12. AGU(s) MILGPS (If required) – Keyed

13. Dropsondes – On/Ready

***NOTE:*** (T-1) A primary and secondary dropsonde are usually prepped prior to the airdrop and must be separated by a minimum of 1 MHz.

***NOTE:*** (T-3) For combat drops, removed the label showing the frequency after the dropsonde has been preflighted. Place the label on the On/Off tool. This will show it has been preflighted and prevent frequencies from being discovered should the dropsonde be recovered.

***NOTE:*** (T-3) Preflight dropsondes inside the aircraft to ensure the UHF-DRS and GPS-RTS are operating. With the ramp and door open and at least three GPS satellites low on the horizon, the dropsondes in the back of the cargo compartment can still acquire a GPS satellite signal even with a malfunctioning GPS-RTS. To prevent this from occurring, dropsondes should be brought forward in the cargo compartment or the ramp and door should be closed.

a. Thread UHF antenna into dropsonde nose cone

b. Insert On/Off tool into dropsonde

c. Orient dropsonde so UHF antenna points toward the ground and wait for steady LED

d. Allow dropsonde to maintain GPS lock position for at least 30 seconds.

14. JPADS Laptop – On

15. Confirm/Input JPADS Application – Complete

a. Select load and chute information and update (If required)

(1) Confirm/update load weights
(2) Confirm/update load position
(3) Input AGU Communication IDs (If required)

b. Program UHF-DRS radio (If required)

(1) Confirm aircraft UHF radios on
(2) Select WEATHER
(3) Select receiver setup
(4) Input dropsonde frequencies

16. Dropsonde Communication – Confirmed

a. Confirm dropsonde ID block at top of screen to verify dropsonde is communicating with UHF-DRS.

b. Check dropsonde latitude/longitude to ensure the received position matches aircraft.

***NOTE:*** If error is suspected, check aircraft GPS and GPS retransmitter.

c. (T-2) Confirmed number of satellites acquired – should have a minimum of four

d. Confirm GDOP reading is 5 or less

e. Check battery voltage - minimum of 3.5 VDC.

17. Compute CARP/LAR – Complete

***CAUTION:*** (T-2) The PADS operator must confirm the collateral damage assessment is still valid after entering new data.

***NOTE:*** During permission when preparing to drop a dropsonde or I-CDS/I_CRL, compute the CARP and Chute failure footprint and success footprint with “FULL footprints”.

***NOTE:*** During permission when preparing to drop guided systems, compute the CARP, guidance failure footprint and Launch Acceptability Region (LAR) with “No footprints”. Also compute to determine the chute failure footprint with “FULL footprints”.

18. AGU(s) Update – Complete

a. Turn wireless internet on

b. Verify internet connected (mode: JPADS for FIREFLY/MICROFLY)

c. Select loads

d. Communication – Wireless Ethernet

e. Select send to selected load

f. Verify update

19. Dropsondes – Off

***NOTE:*** (T-3) Dropsondes only have a 1-hour battery life and therefore must be managed carefully.

20. Autonomous Guidance Units (AGU) – Off

21. Identify Primary and Secondary Dropsondes to LM – Complete

***NOTE:*** Determine primary and secondary based on observed reception quality

22. JPADS Laptop – Off

23. UHF-DRS and GPS-RTS – Off

***NOTE:*** Ensure JPADS laptop is completely shut down before removing power from the UHF-DRS and GPS-RTS.

***NOTE:*** (T-2) The UHF-DRS and GPS-RTS must be turned off prior to the BEFORE STARTING ENGINES Checklist.

24. PADS Operator Preflight Checklist – Complete

**A2.3. Airdrop Checklist (Pilot/Crew).** (T-1) The Pilot/Crew Airdrop checklist is a single use checklist for all tactical airdrop deployments with the exception of dropsonde airdrops. Loadmasters will employ the Personnel/Equipment or CDS checklist, as appropriate, based on the type of load being dropped. See **paragraphs A2.5** and **A2.10** The load type will be validated by the pilot’s call during the Twenty-Minute Checklist. ***NOTE:*** (T-1) Dropsonde deployments will be conducted using the Pilot/Crew Dropsonde Checklist.

**TWENTY-MINUTE CHECKLIST**

*PILOT/CREW AIRDROP*

1. **"CREW, TWENTY-MINUTE WARNING"** (N)
2. **"TWENTY-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

3. "**STATE TYPE OF DROP"** (P)

   a. **"HIGH ALTITUDE"** (As required) (P)

   b. **"PARATROOP DOOR / TAILGATE EXIT"** (As required) (P)

***NOTE:*** The "Type of Drop" call validates the load type for loadmasters and confirms the loadmaster checklist used. State "Personnel/Equipment", "CDS", "I-CDS", "I-CRL" or "JPADS" as applicable.

"*"4. GPS-RTS – "**ON**" (If required) (LM)

"*"5. JPADS laptop – On (N/PO)

"*"6. Autonomous Guidance Units (AGU) (If required) – **"ON"** (LM)

7. Slowdown, Drop Zone and Escape – (T-1) **"REVIEWED"** (P)(CP)(N)

   a. AF Form 4123, **Airdrop Card**, updated and briefed.

   b. The navigator and pilot will brief or update items IAW with the Airdrop Briefing Guide. See AFI 11-2HC-30V3 CL-1.

***NOTE:*** **(T-2)** For High Altitude airdrops, compare spot winds to preflight HARP winds and notify the jumpmaster of significant deviations.

8. DZ Data [N/A for JPADS/Improved airdrop]– (T-1) **"CHECKED"** (P/CP)(N)

***NOTE:*** For JPADS and Improved drops using the JPADS-MP, Computer/SCNS Data is checked during the 10 Minute Checklist.

   a. The navigator and pilot/copilot will verify DZ information entered into SCNS. (T-2)

      (1) DZ Coordinates
      (2) Altitude information
      (3) Run in heading
      (4) Slowdown information
      (5) Ballistics information (vertical information)

   b. [For mission computer airdrops (MCAD)] OAP information will be verified. (T-2)

9. Helmet and Oxygen – **“ON”** (As required) (P)(CP)(N)(AMSS)(LM)(E)

10. Pressurization – Depressurizing (E)

***NOTE***: (T-1)The flight engineer will plan to be depressurized prior to completion of the Ten-Minute Checklist.

11. Twenty-Minute Checks – **"COMPLETE"** (LM)(E)

**TEN-MINUTE CHECKLIST**
*PILOT/CREW AIRDROP*

1. "**CREW, TEN-MINUTE WARNING"** (N)

2. **"TEN-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

3. Computer Jump Switch – **"AD/TJ MANUAL"** (CP)

***NOTE:*** The switch is actually called the Airdrop/Troop Jump Computer Manual Select Switch.

4. Red Light – **"ON"** (P/CP)

5. Aircraft Oxygen System (As required)(T-1) – **“CHECKED”** (CP)

a. (T-1) The copilot will check both oxygen system indicators to ensure sufficient oxygen is available for intended operations and that no abnormal indications exist.

6. Aux Pump (As required) – **"ON"** (CP)

7. Altimeters - **"SET, STATE SETTING"** (P)(CP)
**“SET, STATE SETTING, SCNS SET”** (N)

8. IFF/ETCAS – **“SET, STATE SETTING”** (CP/E)

a. Set IFF/ETCAS to TA, NORM, or STBY for airdrop operations depending on tactical situation and MAJCOM/theater guidance.

9. High Altitude Checks (As required) – **"COMPLETE"** (P)(CP)(N)(AMSS)(LM)(E)

a. Each crewmember will accomplish the following prior to calling this step complete: (T-1)

(1) Mask – On and connected
(2) Regulator – On/100 Percent
(3) Mask and Hose Connection – Checked

(4) Regulator Flow Indicator – Checked

***WARNING (T-1)*** The "High Altitude Checks" will initially be called "Complete" during the Ten-Minute Checklist and prior to reaching a cabin altitude of 10,000 feet. The checks will be silently re-accomplished every 5,000 feet above a 10,000-foot cabin altitude. When above 20,000-foot cabin altitude, accomplish this check every 15 minutes. Above 30,000 feet, accomplish every 5 minutes.

***NOTE: (T-1)*** If climbing above 10,000 feet MSL, all personnel will don their helmet, mask, and set oxygen regulators to 100 percent. Parachutists may operate without the supplemental oxygen during unpressurized flight up to 13,000 feet MSL provided the elapsed time above 10,000 feet MSL does not exceed 30 minutes per sortie. Under circumstances other than these, jumpers will use supplemental oxygen. When supplemental oxygen is required for parachutists, a check of the oxygen console, connections, pressure, and quantity is required. The loadmaster will confirm that the cargo compartment crewmembers have completed this action by receiving a thumb up indication from each person.

10. CDS Flap Setting (As required) –

a. **"COMPUTED, STATE SETTING"** (P/CP)

b. **"VERIFIED"** (E)

11. Pressurization – **"DEPRESSURIZED"** (E)

***NOTE:*** For Non-Guided / Non-Improved drops proceed to step 17.

"*"12. Wind Data – Plotted (N/PO)

a. Plot dropsonde data.

"*"13. JPADS-MP Generated CARP – Completed (P/CP)(N/PO)

***NOTE:*** During execution when preparing to drop I-CDS/I_CRL, compute the CARP and Chute failure footprint and success footprint with "QUICK footprints".

***NOTE:*** During execution when preparing to drop guided systems, compute the CARP, guidance failure footprint and Launch Acceptability Region (LAR) with "NO footprints". Also compute to determine the chute failure footprint with "QUICK footprints".

***CAUTION:*** (T-2) The PADS operator must confirm the collateral damage assessment is still valid after entering new data.

c. Ensure new coordinates are different than preflight coordinates if a Dropsonde is incorporated.

d. Record new coordinates.

“*”14. Computer/SCNS Data – **“CHECKED”** (P/CP)(N/PO)

A. Check all computer stored information

B. Enter/verify information on DZ waypoint and airdrop page
(1) Enter/verify DZ coordinates LAT, LON
(2) Enter/verify TOT

c. Enter/verify Ballistic data on DZ INFO page

d. Enter/verify information on AIRDROP page
(1) Drop reference (V/S/R)
(2) Altitude gate (ON/OFF)
(3) Altitude/ballistic (W/V)
(4) Wind factor

e. Verify/Check Dropsonde Data
“*”15. Mission Data Transfer (If Required) – **“COMPLETE”** (N/PO)
“*”16. AGU Status (If required) – **“READY”** (LM)

b. *FIREFLY/MICROFLY:* “Ready to Fly” on LCD denotes GPS Lock

***NOTE:*** If the LCD does not indicate “Ready to Fly”, turn power off, wait 5 seconds, turn power on. After recycling power, if the LCD still does not indicate “Ready to Fly”, the bundle may be dropped with any indication other than “FATAL ERROR”. Advise the PIC of condition and do not drop with “FATAL ERROR” indication.

17. Ten Minute Checks -**"COMPLETE"** (LM)(E)

## SIX-MINUTE ADVISORY
*PILOT/CREW AIRDROP*

***NOTE:*** Required for personnel and combination drops only.

1. **"CREW, SIX-MINUTE ADVISORY"** (N)

2. **"SIX-MINUTE ADVISORY ACKNOWLEDGED LM"** (LM)

“*”3. **“DATA PASSED TO JUMPMASTER”** (If required) (N)

***NOTE:*** Distance and direction from release point to target passed to jumpers.

**SLOWDOWN CHECKLIST**
**(Paratroop Door Exit)**
*PILOT/CREW AIRDROP*

***NOTE:*** Initiate Slowdown at DZ Entry Point if using IFR Drop Corridor procedures.

| | |
|---|---|
| 1. **"30 SECONDS TO SLOWDOWN"** | (N) |
| 2. **"5 SECONDS TO SLOWDOWN"** | (N) |
| 3. **"SLOWDOWN NOW"** | (N) |
| 4. Flaps – **"50 PERCENT"** | (P/CP/E) |
| 5. Radar Altimeter – **"SET, STATE SETTING"** | (P)(N) |
| 6. Air Deflector Doors – **"OPEN"** | (P/CP) |

***NOTE:*** Once air deflector doors are called open by the pilot or copilot, this automatically clears the loadmaster to open the paratroop door(s).

| | |
|---|---|
| 7. Paratroop Doors – **"OPEN AND LOCKED"** | (LM) |
| 8. Slowdown Checks – **"COMPLETE"** | (LM)(E) |

**SLOWDOWN CHECKLIST**
**(Tailgate Exit)**
*PILOT/CREW AIRDROP*

| | |
|---|---|
| 1. "**30 SECONDS TO SLOWDOWN"** | (N) |
| 2. "**5 SECONDS TO SLOWDOWN"** | (N) |
| 3. **"SLOWDOWN NOW"** | (N) |
| 4. Flaps – **"50 PERCENT"** | (P/CP/E) |
| 5. Radar Altimeter – "**SET, STATE SETTING"** | (P)(N) |
| 6. Ramp and Door | |
| a. **"CLEAR TO OPEN"** | (LM)(P) |
| b. **"OPEN AND LOCKED"** | (LM) |

c. **"INDICATES OPEN"** (E)

***WARNING:*** **(T-2)** If the cargo ramp and door fail to operate normally or the mission dictates, the loadmaster may operate them from the aft control panel upon clearance from the pilot and once the lifeline is attached and adjusted.

***CAUTION:*** **(T-1)** The flight engineer will monitor and ensure the ramp and door open light on the ADS panel remains illuminated for the entire drop. Failure of the light to illuminate or remain illuminated constitutes a no drop condition.

***NOTE:*** **(T-2)** The flight engineer will open the ramp and door at 150 KIAS after receiving clearance to open from the pilot and loadmaster, and will report "Indicates Open" when the ramp and door light illuminates.

7. Flaps [For CDS only] – **"SET, STATE SETTING"** (P/CP/E)

a. Reset Flaps to CDS flap setting.

***WARNING:*** **(T-2)** If the drop is aborted after completion of the Slowdown checks, the loadmaster will request closure of the ramp and door from the cockpit after ensuring the aft anchor cable supports are raised.

***NOTE:*** After drop airspeed is established, reset the flaps in accordance with the charted CDS flap setting charts. See AFI 11-2HC-130V3 CL-1.

8. Slowdown Checks – **"COMPLETE"** (LM)(E)

**TWO-MINUTE WARNING**
*PILOT/CREW AIRDROP*

***NOTE:*** Required for high altitude personnel airdrops only

1. **"CREW, TWO-MINUTE WARNING"** (N)

2. **"TWO-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

3. Two-minute Checks – **"COMPLETE"** (LM)

**ONE-MINUTE WARNING**
*PILOT/CREW AIRDROP*

1. **"CREW, ONE-MINUTE WARNING"** (N)

2. **“ONE-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

“*”3. **“GPS FOM, STATE READING”** [Guide/Improved Drops Only] (N)

***NOTE:*** **(T-1)** During training I-CDS/I-CRL deployments, a GPS Figure of Merit (FOM) of 3 or less or verification of waypoints by MCAD offset aimpoints is required. For JPADS operations, a GPS Figure of Merit (FOM) 3 or less is required from the 1 minute warning until “Green Light”. A “No Drop” will be called if these conditions are not met.

4. One-Minute Checks – **"COMPLETE"** (LM)

**RELEASE POINT CHECKLIST**
*PILOT/CREW AIRDROP*

***NOTE:*** (T-2) For high altitude MFF airdrops, the navigator will provide a “15 seconds” call if requested by the jumpmaster. This call is in addition to the “5 seconds” call.

1. **“5 SECONDS”** (N)

***NOTE:*** **(T-1)** If all preceding checks are not complete by the "5 Seconds" call, a “No Drop” will be called.

2. **"GREEN LIGHT"** (N)

3. **"ON" (T-2)** (P/CP)

   a. The non-flying pilot will turn on the green light at the Navigator’s call. (T-2)

4. **"GATE RELEASED"** (or state condition) (As required) (LM)

5. **"LOAD CLEAR"** (or state condition) (LM)

***NOTE*:** (T-1) Flaps will be reset to 50 percent as soon as the loadmaster calls "Load Clear".

6. **"RED LIGHT" (T-2)** (N)

   a. The navigator will call "Red Light" at the expiration of the "Green Light" time or upon hearing the loadmaster’s call of "Load Clear," whichever occurs first.

7. **“ON”** (P/CP)

   a. Pilot not flying will turn on Red Light at navigators call. (T-2)

## COMPLETION OF DROP
**(Paratroop Door Exit)**
*PILOT/CREW AIRDROP*

***NOTE:*** (T-1) This checklist will be initiated at the "Red Light" command or by a "No Drop" call.

| | |
|---|---|
| 1. **"PARATROOP DOOR(S) CLOSED AND LOCKED"** | (LM) |
| 2. Air Deflector Doors – **"CLOSED AND OFF"** | (P/CP) |
| 3. Flaps – **"SET, STATE SETTING"** | (P/CP/E) |
| 4. Red Light – **"OFF"** | (P/CP) |
| 5. Radar Altimeters – **"SET, STATE SETTING"** | (P)(N) |
| 6. IFF/ETCAS – **"SET, STATE SETTING"** | (CP/E) |
| 7. Pressurization – Set | (E) |
| 8. Drop Checks – **"COMPLETE"** | (LM)(E) |

## COMPLETION OF DROP
**(Tailgate Exit)**
*PILOT/CREW AIRDROP*

***NOTE:*** (T-1) This checklist will be initiated at the "Red Light" command or by a "No Drop" call.

1. Flaps [For CDS only] – **"50 PERCENT"**(P/CP/E)

***NOTE:*****(T-1)** Flaps should be reset 50 percent as soon as the loadmaster calls "Load Clear". If there is a malfunction or a "No Drop", immediately reset the flaps to the most appropriate position.

2. "**RAMP AND DOOR CLOSED AND LOCKED**" (LM)

***NOTE:*** **(T-1)** The loadmasters will close the Ramp and Door as soon as they clear the area of static lines and Anchor Cable Supports.

***NOTE: (T-1)*** The flight engineer will ensure the ADS and Master Door Warning Light is out and the ADS switch is in the off position prior to calling for flaps.

3. Flaps – **"SET, STATE SETTING"** (P/CP/E)

4. Aux Pump – **“OFF”** (CP)

5. Red Light – **"OFF"** (P/CP)

6. Radar Altimeters – **“SET, STATE SETTING”** (P)(N)

7. IFF/ETCAS – **“SET, STATE SETTING**” (CP/E)

8. Pressurization – Set (E)

9. Drop Checks – **"COMPLETE"** (LM)(E)

***NOTE:*** For multiple passes of CDS, allow several minutes after the Drop Checks are complete for the Loadmasters to accomplish necessary items on the Cleanup Checklist.

**A2.4. Dropsonde Checklist (Pilot/Crew). (T-1)** Dropsonde airdrops will be conducted using zero percent flaps, between 170 and 180 KIAS, using only the cargo door. This configuration will prevent the dropsonde from striking the tail of the aircraft. Loadmasters will open the cargo door from the aft control panel for dropsonde airdrops. If a designated PADS operator (PO) is not on board, the navigator will perform PO duties and make all calls as the navigator.

***CAUTION:*** (T-1) When tactical situation allows, open the cargo door before climbing above 15,000 feet. When airdropping following a high altitude transition (e.g. extended high level flight to a high altitude airdrop) above 10,000 feet MSL, turn on the auxiliary pump prior to depressurization and set aircraft depressurization rate to 1,000 FPM. This time must be factored into the drop sequence to ensure the aircraft is completely depressurized prior to opening the cargo door. If the auxiliary pump stalls during cargo door activation (indicated by a loud audible whine or a pressure reading below 1,000 PSI), allow system pressure to recover by stopping opening or closing action. During unexpected delays it is recommend the auxiliary pump be turned off to prevent overheating. The risk of pump overheating must be weight against the need to rapidly close the cargo door and evade threats.

**TWENTY MINUTE CHECKLIST**

*PILOT/CREW DROPSONDE AIRDROP CHECKLIST*

1. **"CREW, TWENTY MINUTE WARNING"** (N)

2. **"TWENTY-MINUTE WARNING ACKNOWLEDGED LOADMASTER"** (LM)

3. **"DROPSONDE CHECKLIST"** (P)

4. Slowdown, Drop Zone, & Escape - **"REVIEWED"** (P)(CP)(N)

5. Helmet and Oxygen - **"ON"** (as required) (P)(CP)(N)(AMSS)(LM)(E)

6. Pressurization - Depressurizing (E)

***NOTE***: (T-1) The flight engineer will plan to be depressurized prior to completion of the Ten-Minute Checklist.

7. UHF-DRS – **“ON”** (LM)

**NOTE:** (T-2) To ensure sufficient time to acquire GPS lock, the GPS Retransmission System (GPS-RTS) and UHF Dropsonde Receive System (UHF-DRS) should be turned on as soon as possible after takeoff. The UHF-DRS Ethernet light must be flashing green before turning on the JPADS laptop.

8. GPS-RTS – “**ON**” (LM)

9. JPADS laptop – On (N/PO)

10. Twenty-Minute Checks - **"COMPLETE"** (LM)(E)

**TEN MINUTE CHECKLIST**

*PILOT/CREW DROPSONDE AIRDROP CHECKLIST*

1. **“CREW, TEN MINUTE WARNING”** (N)

2. **"TEN MINUTE WARNING ACKNOWLEDGED LOADMASTER"** (LM)

3. Computer Jump Switch - **"AD/TJ MANUAL"** (CP)

4. Red Light - **"ON"** (P/CP)

5. Aircraft Oxygen Systems – (T-1) **“CHECKED”** (if required) (CP)

a. (T-1) The copilot will check both oxygen system indicators to ensure sufficient oxygen is available for intended operations and that no abnormal indications exist.

6. Aux Pump - **"ON"** (CP)

7. Altimeters - **"SET, STATE SETTING"** (P)(CP)

**“SET STATE SETTING, SCNS SET”** (N)

8. IFF/ETCAS – **“SET, STATE SETTING”** (CP/E)

a. Set IFF/ETCAS to TA, NORM, or STBY for airdrop operations depending on tactical situation and MAJCOM/theater guidance.

9. High Altitude Checks - **"COMPLETE"** (if required) (P)(CP)(N)(AMSS)(LM)(E)

a. Each crewmember will accomplish the following prior to calling this step complete: (T-1)

(1) Mask – On and connected

(2) Regulator – On/100 Percent

(3) Mask and Hose Connection – Checked

(4) Regulator Flow Indicator – Checked

***WARNING: (T-1)*** The "High Altitude Checks" will initially be called "Complete" during the Ten-Minute Checklist and prior to reaching a cabin altitude of 10,000 feet. The checks will be silently re-accomplished every 5,000 feet above a 10,000-foot cabin altitude. When above 20,000-foot cabin altitude, accomplish this check every 15 minutes. Above 30,000 feet, accomplish every 5 minutes.

***NOTE:*** **(T-1)** If climbing above 10,000 feet MSL, all personnel will don their helmet, mask, and set oxygen regulators to 100 percent. Parachutists may operate without the supplemental oxygen during unpressurized flight up to 13,000 feet MSL provided the elapsed time above 10,000 feet MSL does not exceed 30 minutes per sortie. Under circumstances other than these, jumpers will use supplemental oxygen. When supplemental oxygen is required for parachutists, a check of the oxygen console, connections, pressure, and quantity is required. The loadmaster will confirm that the cargo compartment crewmembers have completed this action by receiving a thumb up indication from each person.

10. Computer/SCNS Data – **"CHECKED"** (P/CP)(N)

A. Check all computer stored information

B. Enter/verify information on DZ waypoint and airdrop page
(1) Enter/verify DZ coordinates LAT, LON
(2) Enter/verify TOT

c. Enter/verify Ballistic data on DZ INFO page

d. Enter/verify information on AIRDROP page
(1) Drop reference (V/S/R)
(2) Altitude gate (ON/OFF)
(3) Altitude/ballistic (W/V)
(4) Wind factor

e. Verify/Check Dropsonde Data

11. UHF Antenna – **"BOTTOM"** (CP)
12. Dropsonde Status –

a. **"SERIAL #_______, FREQUENCY_____"** (LM)

b. **"VERIFIED"** (N/PO)

13. Pressurization – **"DEPRESSURIZED"** (E)

14. Ten Minute Checks – **"COMPLETE"** (LM)(E)

**SLOWDOWN CHECKLIST**

*PILOT/CREW DROPSONDE AIRDROP CHECKLIST*

| | |
|---|---|
| 1. **“30 SECONDS TO SLOWDOWN”** | (N) |
| 2. **“5 SECONDS TO SLOWDOWN”** | (N) |
| 3. **"SLOWDOWN NOW"** | (N) |
| 4. Flaps (as required) – **"UP"** | (P/CP/E) |
| 5. Radar Altimeter - **"SET, STATE SETTING"** | (P)(N) |
| 6. Ramp and Door – | |
| a. **"CLEAR TO OPEN"** | (P) |
| b. **"OPEN AND LOCKED"** | (LM) |

***CAUTION:*** (T-2) The loadmaster will operate the cargo door from the aft control panel for all dropsonde airdrops. The pilot will not call “Clear to Open” until the aircraft is below 185 KIAS for cargo door.

| | |
|---|---|
| 7. Dropsonde UHF Transmitter – **“ACTIVE”** | (N) |
| 8. Slowdown Checks - **"COMPLETE"** | (LM)(E) |

**ONE-MINUTE WARNING**

*PILOT/CREW DROPSONDE AIRDROP CHECKLIST*

| | |
|---|---|
| 1. **"CREW, ONE-MINUTE WARNING"** | (N) |
| 2. **“ONE-MINUTE WARNING ACKNOWLEDGED LM"** | (LM) |
| 3. **“GPS FOM, STATE READING”** | (N) |

***NOTE:*** **(T-1)** During training flights, the SCNS Figure of Merit (FOM) must be 3 or less or a “No Drop” will be called.

**RELEASE POINT CHECKLIST**

*PILOT/CREW DROPSONDE AIRDROP CHECKLIST*

| | |
|---|---|
| 1. **“5 SECONDS”** | (N) |

***NOTE:*** **(T-1)** If all preceding checks are not complete by the "5 Seconds" call, a “No Drop” will be called.

| | |
|---|---|
| 2. **"GREEN LIGHT"** | (N) |
| 3. **"ON"** | (P/CP) |

a. The non-flying pilot will turn on the green light at the Navigator’s call. (T-2)

b. Loadmasters will release the dropsondes from the corner of the cargo ramp, which will be in the fully closed position. Upon hearing and seeing "Green Light", release the dropsonde at a 45-degree angle away from the corner of the ramp. (T-2)

4. **"LOAD CLEAR"** (or state condition) (LM)

6. **"RED LIGHT"** (N)

a. The navigator will call "Red Light" at the expiration of the "Green Light" time or upon hearing the loadmaster's call of "Load Clear," whichever occurs first. (T-2)

7. **"ON"** (P/CP)

a. Pilot not flying will turn on Red Light at navigators call. (T-2)

## COMPLETION OF DROP

*PILOT/CREW DROPSONDE AIRDROP CHECKLIST*

***NOTE:*** **(T-1)** This checklist will be initiated at the "Red Light" command or by a "No Drop" call.

1. "**CARGO DOOR CLOSED AND LOCKED**" (LM)

***NOTE:*****(T-1)** The loadmasters will close the Cargo Door from the aft control panel.

***NOTE:*** **(T-1)** The flight engineer will ensure Master Door Warning Light is out prior to calling for flaps.

2. Flaps – **"SET, STATE SETTING"** (P/CP/E)
3. Aux Pump – **"OFF"** (CP)
4. Red Light – **"OFF"** (P/CP)
5. Radar Altimeters – **"SET, STATE SETTING"** (P)(N)
7. IFF/ETCAS – **"SET, STATE SETTING**" (CP/E)
8. Pressurization – Set (E)
9. Drop Checks – **"COMPLETE"** (LM)(E)

**A2.5. Personnel/Equipment Airdrop Checklist (Loadmaster). (T-1)** This Loadmaster checklist is used for deployment of personnel, high altitude personnel, equipment, container ramp loads (CRL), I-CRL and JPADS CRL loads either separately or in combination. Loadmasters will thoroughly pre-brief verbal/visual signals and establish coordinated task prior to the first airdrop warning.

***NOTE:*** Items marked by an asterisk "*" are steps specific to JPADS (Guided/Improved) deployments.

## TWENTY-MINUTE CHECKLIST

*LOADMASTER PERSONNEL / EQUIPMENT AIRDROP*

1. **"CREW, TWENTY-MINUTE WARNING"** (N)
2. **"TWENTY-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

3. Jumpmaster – Alerted

4. Helmet and Oxygen Mask – **"ON"**(As required) (P)(CP)(N)(AMSS)(LM)(E)

5. Helmet – On

***NOTE:*** (T-1) When oxygen is not required, the loadmaster(s) will don their helmet IAW MAJCOM directives.

***WARNING:*** **(T-1)**Ensure all personnel not involved with the airdrop remain seated forward of all parachutists with seat belts fastened and headgear donned, if required.

“*”6. GPS-RTS (if required) – **“ON”** (LM)

7. Aft Anchor Cable Support(s) – Lowered (Paratroop door exit only)

8. Anchor Cables – Attached to Center Anchor Cable Supports (Paratroop door exit only)

9. Anchor Cable Stops – Positioned and Secured (As required)

10. Static Line Retriever Cable – Safety Tied and Checked (As required)

“*”11. Autonomous Guidance Units (AGU) (If required) – **“ON”** (LM)

12. Retrieval Sling Assembly – Attached and Safety Tied (As required).

13. Retrieval Assist Strap (Roller Assembly) – Positioned and Secured (As required)

14. Ramp ADS Support Arms – Checked (Ramp exit only)

15. Bundle Rigging – Inspected

    a. Static Line – Connected forward of anchor cable stop

    b. Gate Tension – Checked

16. Bundle Marker Lights – Activated (As required)

17. Jump Platform Lights – As required

***NOTE:*** For night airdrops, set the jump lights to low intensity.

18. LPU's (RAMZ) – Checked/Inflated (As required)

19. Cargo Compartment Lights – As required

***NOTE:(T-2)*** [non-NVIS compatible cargo compartments]To facilitate dark adaptation ensure the cargo compartment lights are set to dim and/or red at least 30 minutes prior to night airdrop.

20. Twenty-Minute Checks – **"COMPLETE"** (LM)(E)

## TEN-MINUTE CHECKLIST

*LOADMASTER PERSONNEL / EQUIPMENT AIRDROP*

1. **"CREW, TEN-MINUTE WARNING"** (N)

2. **"TEN-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

3. Jumpmaster – Alerted

4. Red Lights/NVG Airdrop Caution Lights – On/Checked

5. High Altitude Checks (As required) - **"COMPLETE"** (P)(CP)(N)(AMSS)(LM)(E)

   a. Each crewmember will accomplish the following prior to calling this step complete: (T-2)

      (1) Mask – On and connected
      (2) Regulator – On/100 Percent
      (3) Mask and Hose Connection – Checked
      (4) Regulator Flow Indicator - Checked
      (5) Buddy Checks – Complete

***WARNING: (T-1)*** The "High Altitude Checks" will initially be called "Complete" during the Ten-Minute Checklist and prior to reaching a cabin altitude of 10,000 feet. The checks will be silently re-accomplished every 5,000 feet above a 10,000-foot cabin altitude. When above 20,000-foot cabin altitude, accomplish this check every 15 minutes. Above 30,000 feet, accomplish every 5 minutes.

***NOTE: (T-1)*** If an oxygen console is used, the loadmaster(s) will be stationed aft of it to perform in-flight duties. The Physiology Technician (PT) will be on interphone and normally forward of the oxygen console, if used, to perform in-flight duties. This arrangement will provide a buddy system to check everyone on oxygen. Loadmasters and physiological crewmembers will brief verbal and visual signals that will be used throughout the mission.

***NOTE: (T-1)*** If climbing above 10,000 feet MSL, all personnel will don their helmet, mask, and set oxygen regulators to 100 percent. Parachutists may operate without the supplemental oxygen during unpressurized flight up to 13,000 feet MSL provided the elapsed time above 10,000 feet MSL does not exceed 30 minutes per sortie. Under circumstances other than these, jumpers will use supplemental oxygen. When supplemental oxygen is required for parachutists, a check of the oxygen console, connections, pressure, and quantity is required. The loadmaster will confirm that the cargo compartment crewmembers have completed this action by receiving a thumb up indication from each person.

6. Bundle Restraint – Removed

***NOTE:*** *(T-2)* Forward restraint strap may remain in place until the ramp is in the ADS position. However, ensure all restraint is removed prior to the completion of the slowdown checklist.

"*"7. All AGU Control Panels (If required) – Checked

a. *FIREFLY/MICROFLY:* "Ready to Fly" on LCD denotes GPS Lock

***NOTE:*** (T-2) The Loadmaster will check the AGU control panel after the navigator/PAD operator has called the mission data transfer "complete".

"*"8. AGU Status (If required) – **"READY "** (or condition) (LM)

9. All Personnel – Forward of Load

10. Restraint Harness/Parachute – On/Adjusted/Attached

***NOTE:*** Ensure safety personnel have parachutes/restraint harnesses on/adjusted/attached.

11. Restraint Shuttles (Some Airplanes) – Positioned/Connected

***WARNING: (T-1)*** If both paratroop doors are opened, personnel aft of FS 677 must wear two safety lines, one connected to each side of the aircraft.

12. Ten-Minute Checks – **"COMPLETE"** (LM)(E)

## SIX-MINUTE ADVISORY

*LOADMASTER PERSONNEL / EQUIPMENT AIRDROP*

***NOTE:*** Required for personnel and combination drops only.

1. **"CREW, SIX-MINUTE ADVISORY"** (N)

2. **"SIX-MINUTE ADVISORY ACKNOWLEDGED LM"** (LM)

3. Jumpmaster – Alerted

4. Appropriate Seats – Raised

***CAUTION: (T-1)*** Ensure that parachutists have secured all seats (as required) and that no part of the seat protrudes/obstructs the aisle or paratroop doors. Appropriate seats must be raised/stowed prior to the slowdown.

**SLOWDOWN CHECKLIST**
**(Paratroop Door Exit)**

*LOADMASTER PERSONNEL / EQUIPMENT AIRDROP*

***WARNING:*** **(T-1)** Prior to opening the paratroop door(s), all personnel aft of FS 677 will wear a restraining harness with the life-line adjusted and attached; have a parachute with the static line connected to the anchor cable; or will be secured to the aircraft with a seatbelt or using floor loading procedures. ***EXCEPTION:*** Parachutists with reserve or HGRP (high glide ratio parachute) or parachutes supplied by aircrew flight equipment may remain aft of FS 677 provided the aircraft does not descend below 1,000 ft AGL.

1. Air Deflectors – **"OPEN"** (P/CP)

***WARNING:*** If an air deflector fails to open, do not open the respective paratroop door. Notify the pilot of the problem.

***NOTE:*** Once air deflectors are called "Open" by the pilot or copilot, this automatically clears the loadmaster to open the paratroop door.

***NOTE: (T-1)*** The loadmaster will ensure all personnel are aware the doors are going to be opened.

2. Paratroop Door(s) – **"OPEN AND LOCKED"** (LM)

***WARNING:*** (T-1) Paratroop door(s) and cargo door and ramp will not be open at the same time

***WARNING:*** (T-1) Paratroop doors will be opened only by the loadmaster(s). After opening and locking, the safety pin will be installed.

***WARNING:*** **(T-1)** Any time the paratroop doors are lowered, the jump platform will be retracted and the door lowered completely.

3. Jump Platform(s) – Locked in place

***NOTE:*** (T-2) Door bundles will be positioned prior to completion of the slowdown checklist.

4. Paratroop Door Control – Assumed by Jumpmaster/Safety

***WARNING:*** (T-1) Loadmasters will not position themselves under the center anchor cable support.

5. Slowdown Checks – **"COMPLETE"** (LM)(E)

## SLOWDOWN CHECKLIST
**(Tailgate Exit)**

*LOADMASTER PERSONNEL / EQUIPMENT AIRDROP*

***WARNING:*** **(T-1)** Prior to opening the ramp and door, all personnel aft of FS 677 will wear a restraining harness with the life-line adjusted and attached, have a parachute with the static line connected to the anchor cable, or will be secured to the aircraft with a seatbelt or using floor loading procedures. ***EXCEPTION*:** Parachutists with reserve or HGRP (high glide ratio parachute) or parachutes supplied by aircrew flight equipment may remain aft of FS 677 provided the aircraft does not descend below the prebriefed emergency bailout altitude.

***WARNING:*** **(T-2)** When the static line retriever is rigged for tailgate operations, the left side personnel restraint cable will not be used.

***WARNING:*** **(T-1)** Paratroop door(s) and cargo door and ramp will not be open at the same time.

1. Ramp and Door –

a. **"CLEAR TO OPEN"** (LM)(P)

b. **"OPEN AND LOCKED"** (LM)

c. **"INDICATES OPEN"** (E)

***WARNING:*** **(T-2)** If the cargo door and ramp fail to operate normally or when mission dictates, the loadmaster may operate them from the aft control panel upon clearance from the pilot. Ensure the restraint harness life-line is attached to a point to preclude exiting the aircraft prior to proceeding aft to operate the cargo door and ramp controls.

***CAUTION:*** Ensure the aft anchor cable supports are raised and the cargo door and ramp area is clear prior to giving the "Clear to Open" call.

***NOTES:***

The loadmaster will ensure all personnel are aware the doors are going to be opened. (T-1)

The flight engineer will open the ramp and door at 150 KIAS after receiving clearance to open from the pilot and loadmaster and will report "Indicates Open" when the door and ramp light illuminate. (T-2)

2. Aft Anchor Cable Support(s) – Lowered (As Required)

***CAUTION:*** Lower the aft anchor cable supports arm(s) only after the flight engineer states, "Indicates Open."

3. Restraint Shuttles (Some Airplanes) – Positioned

***WARNING: (T-2)*** The shuttle will not be moved aft until after the ramp is lowered.

4. Remaining Restraint – Removed (As Required)

5. Ramp and Door Control – Assumed by Jumpmaster/Safety

***WARNING:*** **(T-1)** Parachutists are cleared to line up along side of the forward most CRL but will not move aft of FS 737 or the forward load static line, whichever is more restrictive. For floor loaded CRL, parachutist will not move aft until the load crosses FS 737 on exit.

***NOTE:*** **(T-1)** All parachutists with the exception of the jumpmaster/safety will remain forward of the ramp hinge until after the One-Minute Warning.

6. Slowdown Checks – **"COMPLETE"** (LM)(E)

***WARNING:*** If the drop is aborted after completion of the Slowdown Checklist, request closure of the ramp and door from the flight deck, after ensuring the aft anchor cable supports are raised.

## TWO-MINUTE WARNING

*LOADMASTER PERSONNEL / EQUIPMENT AIRDROP*

***NOTE:*** Required for High Altitude Personnel Airdrops only.

1. **"CREW, TWO-MINUTE WARNING"** (N)

2. **"TWO-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

3. Jumpmaster – Alerted and Jumpers Positioned

***NOTE:*** **(T-2)** The jumper(s) will disconnect from the console oxygen and be positioned just forward of the ramp hinge.

4. Two-Minute Checks – **"COMPLETE"** (LM)

## ONE-MINUTE WARNING

*LOADMASTER PERSONNEL / EQUIPMENT AIRDROP*

1. **"CREW, ONE-MINUTE WARNING"** (N)

2. **"ONE-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

3. Jumpmaster -Alerted

***NOTE:*** **(T-2)** Jumpers may move aft of the ramp hinge at the jumpmasters discretion after the "One-Minute Warning."

***NOTE:*** Position door bundles prior to completion of the One Minute Checklist.

"*"4. **"GPS FOM, STATE READING"** (N)

***NOTE:*** The navigator will make this call for JPADS/I-CRL drops only.

5. One-Minute Checks - **"COMPLETE"** (LM)

## RELEASE POINT CHECKLIST

*LOADMASTER PERSONNEL / EQUIPMENT AIRDROP*

***NOTE:*** **(T-1)** Standard safety precautions apply when conducting airdrops. Keep working area clear, monitor interphone cords to prevent entanglement, and secure loose objects, etc. If requested/prebriefed, observe jumpers exit and assist jumpmaster/jumper as required. If requested by the jumpmaster during high altitude MFF airdrops, the navigator will state "15 seconds" when fifteen seconds prior to arrival at the release point. Five seconds prior to arrival at the release point, the navigator will state "5 Seconds." If all preceding checks are not complete by the "5 Seconds" call, a "No Drop" will be called.

1. **"GREEN LIGHT"** (N)

2. **"ON"** (P/CP)

***NOTE:*** Verify the Green Light is on

***NOTE:*** Upon hearing the oral signal and seeing the green light illuminate, release the bundle by manually cutting the gate or ejecting it from the aircraft.

3. **"GATE RELEASED"** (or state condition) (As required) (LM)

***WARNING:*** **(T-1)** No person will be aft of the package during gate cut and deployment. If the CRL exists the aircraft, but fails to properly deploy (hangs up), the static lines will be cut immediately.

***CAUTION:*** **(T-2)** The release gate must be cut below the knot to allow the nylon strap to pull free through floor tiedown rings.

***NOTE:*** **(T-2)** This signals that they are clear to follow the load. When jumpers use free fall parachutes, they will not deploy until after the loadmaster retrieves the CRL static lines/parachute D-bags. It may take up to 20 seconds for all equipment and personnel to exit the aircraft.

***NOTE:*** If the load dropped does not have a gate, omit the "Gate Released" call.

4. **"LOAD CLEAR"** (or state condition) (LM)

5. **"RED LIGHT"** (N)

6. **"ON"** (P/CP)

7. Jumpmaster/Safety – Notified (As required) (LM)

**COMPLETION OF DROP CHECKLIST**
**(Paratroop Door Exit)**
*LOADMASTER PERSONNEL / EQUIPMENT AIRDROP*

***NOTE:*** **(T-1)** This checklist will be initiated at the "Red Light" or "No Drop" call.

1. Jump Platform(s) – Folded in

2. Retrieval Sling Assembly – Installed (As required)

3. Static Line(s) – Retrieved/Cut

4. Paratroop Door(s) – **"CLOSED AND LOCKED"** (LM)

5. Anchor Cables – Disconnected from Center Anchor Cable Supports (As required)

***NOTE:*** (T-2) Anchor cables do not have to be disconnected from the center anchor cable supports and aft supports raised if additional airdrops are to be performed, but must be disconnected and raised prior to landing.

6. Aft Anchor Cable Supports – Raised (As required)

7. Parachutes – De-armed (If required for high altitude airdrops)

8. Drop Checks – **"COMPLETE"** (LM)(E)

**COMPLETION OF DROP CHECKLIST**
**(Tailgate Exit)**
*LOADMASTER PERSONNEL / EQUIPMENT AIRDROP*

***NOTE:*** (T-1) This checklist will be initiated at the "Red Light" or "No Drop" call.

1. Static Line(s) – Retrieved/Cut

***CAUTION:*** **(T-2)** Before retrieving static lines, allow a few seconds for the lines to wrap together.

***NOTE:*** (T-2) An immediate turn after "Load Clear" may cause static lines to become entangled on the side of the aircraft.

2. Aft Anchor Cable Support(s) – Raised (As required)

3. Restraint Shuttle (Some airplanes) – Positioned

***WARNING: (T-2)*** The shuttle must be moved forward of the center anchor cable support before raising the ramp to close.

4. Ramp and Door – **"CLOSED AND LOCKED"** (LM)

***WARNING:*** **(T-1)** The loadmasters will ensure that the life line is attached to a point that will preclude exiting the aircraft, prior to proceeding aft to operate the cargo door and ramp controls.

***CAUTION:*** **(T-2)** The loadmaster will close the cargo door and ramp from the aft control panel as soon as the area is clear of all obstructions.

***NOTE:*** Visually check the ramp and door locks after closing.

5. Drop Checks - **"COMPLETE"** (LM)(E)

***NOTE:*** (T-2) Loadmasters will run the AIRDROP CLEANUP Checklist immediately following completion of this checklist.

**A2.6. Fouled/Towed Parachutist Checklist.** See **Chapter 17** for amplifying guidance and additional information.

**FOULED/TOWED PARACHUTIST CHECKLIST**

1. Jumpmaster Notified – To stop remaining parachutists

2. Pilot Notified – **"FOULED/TOWED PARACHUTIST"** (LM)

3. Red/NVG Airdrop Caution Lights – Confirmed on

4. Parachutists Condition – **“PARACHUTIST RELEASED”** or **"INDICATES CONSCIOUS / UNCONSCIOUS"** (LM)

***NOTE:*** (T-1) The jumpmaster/safety observer is responsible for watching the fouled parachutist to determine how the parachutist is entangled. If being towed by anything other than the static line, the jumpmaster or safety will attempt to free the parachutist. If being towed by the static line, the jumpmaster/ safety observer will recommend to the pilot, through the loadmaster, whether to retrieve or cut the parachutist free. If all parachutists have exited and there is no safety on board, this responsibility rests with the loadmaster. The pilot makes the final decision whether to retrieve or cut the parachutist free. The loadmaster will initiate retrieval or cut the parachutist’s static line on the pilot’s command.

***NOTE:*** (T-1) The parachutist will indicate consciousness and that a reserve parachute is ready by maintaining a tight body position with both hands on the reserve.

5. [Paratroop Door Only] Static Line – Cut on pilot's command or Retrieve Parachutist

a. If the decision is to retrieve the parachutist, implement emergency retrieval procedures.

(1) TRPS/5,000 pound tiedown strap – Installed

(2) Jump platforms – Folded in

(3) Retrieve parachutist

***WARNING:*** (T-1) During retrieval, all possible action will be taken to ensure that the parachutist does not slip back at anytime. This does not preclude unwinding the retriever to reset the slip clutch id necessary. All personnel should remain clear of the paratroop door and the line of travel of the static line retriever cable until the parachutist has been retrieved to the door area.

***NOTE:*** **(T-1)** It may be necessary to stop retrieval to manually pull the D-bags through the retriever assist strap (RAS) or over the 5,000 pound tiedown strap.

***NOTE:*** **(T-1)** Once the parachutist is in the door area and is being controlled, slightly unwind the retriever so the parachutist may be brought into the aircraft. The jump platform may be extended once the parachutist is in the door area.

6. [Ramp and Door Only] Static Line – Cut on pilot's command or Retrieve Parachutist

***CAUTION: (T-1)*** If the parachutist is oscillating, stop the retriever momentarily until the parachutist is stabilized, then continue retrieval. Repeat stopping as necessary.

***NOTE:*** It may be necessary to partially rewind the retriever cable to reach the static line for cutting.

a. If the decision is to retrieve the parachutist, implement emergency retrieval procedures.

(1) Strap – Installed

(2) Retrieve parachutist

7. Status of Parachutist – **“RELEASED/RETRIEVED”** (LM)

8. **“MALFUNCTION CHECKLIST COMPLETE”** (LM)

9. Perform Completion of Drop Checklist

**A2.7. Paratroop Door Emergency Parachutist Retrieval Procedures.** There are three methods of retrieval for towed parachutist from the left/right paratroop door of the HC/MC-130 aircraft. The primary retrieval is the Towed Paratrooper Retrieval System (TPRS). The secondary method is with the paratroop retrieval bar for aircraft equipped with this system. The third method is to rig a 5,000 lb. tie-down strap in the paratroop door prior to retrieval. See **Tables A2.1** through **A2.3**

***NOTE:*** (T-1) The maximum allowable weight for a towed paratrooper, without the TPRS, for paratroop door exit is 250 pounds. The limit is 400 pounds when utilizing TPRS (does not apply to combat or actual contingency missions). Jumpmasters are responsible for parachutist weight restrictions. Use of the Retrieval Sling Assembly without the roller assembly is authorized for retrieving static lines only. The Retrieval Sling Assembly together with the Roller Assembly will be used for retrieval of a towed parachutist.

**Table A2.1. Towed Parachutist Retrieval System (TPRS) (T-1).**

| |
|---|
| 1. Install retriever assist strap (RAS/roller system) around static line(s) under retriever sling assembly ensuring quick-snap fittings are re-connected between "A" frame center anchor cable support and anchor cable stop at FS 770 on outboard anchor cable. |
| 2. Install retriever sling assembly around parachutist static line(s) and pull sling loop tight with retrieval sling hook |
| 3. Fold in jump platform and initiate retrieval.<br><br>a. If the aircraft has been modified with the slip clutch assembly to the static line retriever winch, engage static line retriever winch until it slips. If the retriever clutch slips prior to bringing the parachutist into the paratroop door area, determine and remove the cause of the overload, slightly unwind the static line retriever winch to reset the winch’s slip clutch, and continue retrieval operation.<br><br>***WARNING*:** During retrieval attempts, take all possible action to ensure the parachutist does not slip back at any time. This does not preclude unwinding the static line retriever to reset the slip clutch, if necessary.<br><br>b. Stop retrieval when the cotton sleeve at the apex of the D-bags begins to pass through the RAS. |
| 4. As the parachutist is pulled up to the door, swing parachutist into the aircraft by hand, close and secure paratroop door. |

| |
|---|
| a. If the parachutist is not in the paratroop door, (e.g., positioned in the lower aft corner of the paratroop door) it will become necessary to pull the D-bags manually through the RAS. The primary loadmaster maintains control of the static line retriever pistol grip. The secondary loadmaster (if available) or safety observer/jumpmaster (if also onboard) routes D-bags through the RAS.<br><br>***WARNING*: ** All personnel should remain clear of the paratroop door and line of travel of the static line retriever cable until the parachutist has been retrieved into the door.<br><br>b. After D-bags have been brought into the aircraft, manually pull them far enough forward so as not to interfere with the remaining retrieval.<br><br>c. As the parachutist is pulled up to the paratroop door, swing parachutist into the aircraft by hand, close and lock paratroop door. |
| 5. After retrieving the parachutist, reset flaps to 50 percent, raise the landing gear, and accomplish the completion of drop checklist. |

**Table A2.2. Paratroop Retrieval Bar (T-1).**

| |
|---|
| 1. Install the parachutist retrieval bar in the paratroop door. One end of the bar is inserted in the retaining bracket on the aft portion of the door frame. The other end of the bar is then carefully raised and inserted on the forward portion on the door frame. |
| 2. Fold in the jump platform. |
| 3. Using the static line retriever, retrieve the static lines over the bar. |
| 4. The loadmaster initiates retrieval using the static line retriever winch.<br><br>***WARNING:*** During retrieval attempts, take all possible action to ensure the parachutist does not slip back at any time. This does not preclude unwinding the static line retriever to reset the slip clutch, if necessary.<br><br>a. Stop retrieval when the cotton sleeve at the apex of the D-bags begins to pass over the paratroop retrieval bar. |
| 5. As the parachutist is pulled up to the door, swing parachutist into the aircraft by hand.<br><br>a. If the parachutist is not in the paratroop door, (e.g., positioned in the lower aft corner of the paratroop door) it will become necessary to pull the D-bags manually through the opening between the retrieval bar and the paratroop door. The primary loadmaster maintains control of the static line retriever pistol grip. The secondary loadmaster (if available) or safety observer/jumpmaster (if also onboard) routes the D-bags through the opening.<br><br>***WARNING:*** All personnel should remain clear of the paratroop door and line of travel of the static line retriever cable until the parachutist has been retrieved into the door. Once D-bags have been brought into the aircraft, manually pull them far enough forward so as not to interfere |

| |
|---|
| with the remaining retrieval.<br>***NOTE:*** When the parachutist is in the door area and is being controlled by the loadmaster/safety observer/jumpmaster, slightly unwind the static line retriever to relieve tension on the static line so the parachutist may be brought into the aircraft. |
| 6. After retrieving the parachutist accomplish the completion of drop checklist. |

**Table A2.3. 5,000 lb Tie-down Strap (T-1).**

| |
|---|
| 1. The loadmaster folds the jump platform in. |
| 2. Install a 5,000 lb. tie-down strap across the paratroop door by threading the hook end of the strap behind the one-inch tubular brace located at FS 737, across the door under all static lines, and behind the one-inch tubular brace at FS 700. Secure the hook end of the tie-down strap to a tie-down ring forward of FS 700 and ratchet end to any convenient tie-down ring aft of FS 737. Remove as much slack as possible.<br>***WARNING:*** Use extreme caution when routing 5,000 lb. strap over the oxygen regulators located at FS 740 left and right side. |
| 3. Push the static lines to the top of the paratroop door and remove additional slack in the tie-down strap by using the ratchet. |
| 4. Follow the procedures as indicated in the paratroop retrieval bar method starting with Step 3. |

**A2.8. Cargo Ramp and Door Emergency Parachutist Retrieval Procedures.** (T-1)

***WARNING*****:** The maximum weight of parachutists dropped off the ramp during training is 325 pounds. Jumpmasters are responsible for parachutist weight restrictions.

***NOTE*****:** It will be necessary to partially retrieve the static line with the static line retriever to reach the line for cutting. If the parachutist does not signal, cannot be observed, or a condition exists that prevents cutting the static line, implement emergency retrieval procedures.

**Table A2.4. Aircraft Not Modified with Quick-Retrieval Tiedown Rings (T-1).**

| |
|---|
| 1. Thread the hook end of a 5,000 lb. tie-down strap, front to rear, around the right vertical support member at FS 840 approximately 5 1/2 feet above the ramp in the ADS position. |
| 2. Attach the hook end into the strap and draw taut. |
| 3. Run the ratchet end of the strap across the ramp and thread it, front to rear, around the left vertical -support member at FS 840. |
| 4. Remove all slack from the strap and attach the ratchet end to any convenient tie-down ring forward of FS 840. Ratchet the strap until taut. |
| 5. Using the static line retriever retrieve the static lines over the strap and as the parachutist is pulled up to the ramp, bring parachutist into the aircraft by hand under the strap.<br>***WARNING:*** The last 5 feet are the most crucial for the fouled parachutist. A wildly oscillating parachutist usually strikes the aircraft ramp head first. If the parachutist is oscillating violently, it may become necessary to stop the retrieval momentarily, allowing the parachutist to stabilize, |

| |
|---|
| then continue with the retrieval. Repeat these stops continually, if required.<br>***NOTE:*** After the parachutist is pulled up to the ramp and is being controlled by the jumpmaster/safety observer/loadmaster, slightly unwind the static line retriever to relieve tension on the line so the parachutist may be brought into the aircraft. |
| 6. After retrieving the parachutist, accomplish the completion of drop checklist.<br>***CAUTION:*** For aircraft equipped with ramp air deflectors, after the jumper has been successfully retrieved and secured, remove the 5000 pound strap prior to closing the aft cargo door and ramp. Failure to do so will cause the ramp air deflectors to contact the strap causing damage to the aircraft or the strap to break. |

**Table A2.5. Aircraft Modified with Quick-Retrieval Tie-down Rings (T-1).**

| |
|---|
| 1. Attach hook end of the pre-positioned 5,000-pound tie-down strap facing forward to the tie-down ring on the side of the aircraft from which the parachutist is being towed. Attach the ratchet end of the tie-down strap to the opposite tie-down ring and ratchet until two turns of webbing are around the spindle and strap is taut. |
| 2. Emergency retrieval tie-down strap will be pre-measured and excess taped prior to takeoff. S-fold the excess strap and tape near the ratchet end of the strap with pressure-sensitive tape. Pre-measure strap so with both ends connected to the tie-down rings and two wraps around the spindle, the excess strap remains securely taped. Pre-position strap so that it is accessible if needed prior to take-off. |
| 3. Using the static-line retriever retrieve the static lines over the strap and as the parachutist is pulled up to the ramp, bring the parachutist into the aircraft by hand underneath the strap.<br>***WARNING:*** The last five feet are the most crucial for the fouled parachutist. A wildly oscillating parachutist usually strikes the aircraft ramp head first. If the parachutist is oscillating violently, it may become necessary to stop the retrieval momentarily, allowing the parachutist to stabilize, then continue with the retrieval. Repeat these stops continually, if required.<br>***NOTE:*** After the parachutist is pulled up to the ramp and is being controlled by the jumpmaster/safety observer/loadmaster, slightly unwind the static line retriever to relieve tension in the line so the parachutist may be brought into the aircraft. |

**A2.9. Manual Static Line Retrieval Procedures.** During combat, cut static lines which cannot be retrieved. On other than combat missions, if the static line retriever fails during retrieval and more than 10 static lines are to be retrieved from the paratroop door, manually retrieve the static lines by using a 5,000 lb tie-down strap.

**Table A2.6. Manual Static Line Retrieval Procedures (Paratroop Door) (T-1).**

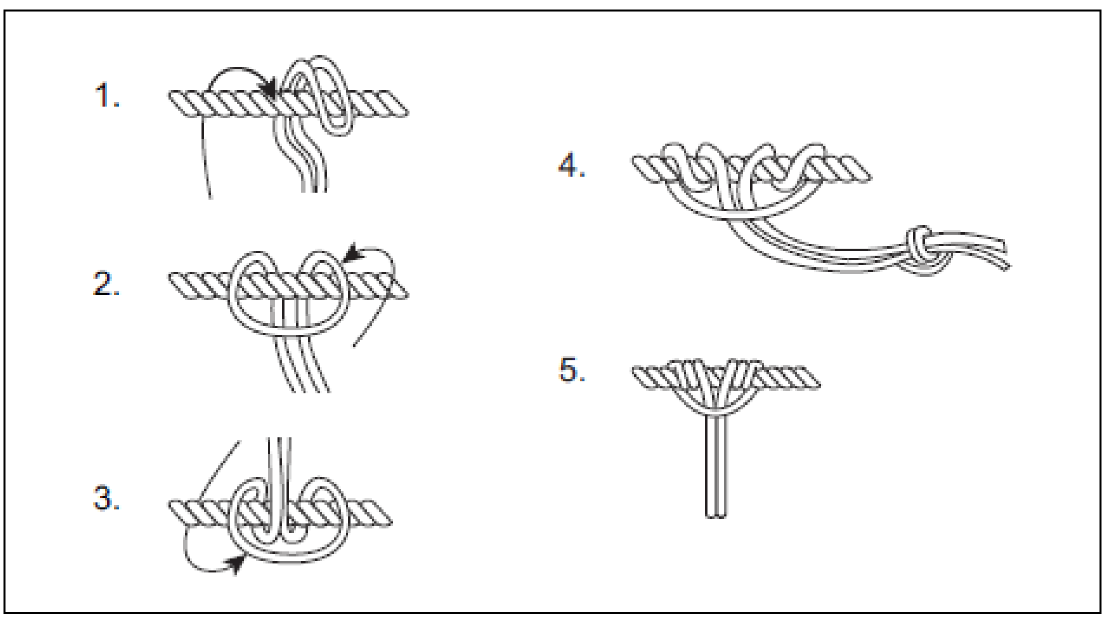
| |
|---|
| 1. Secure the hook end to a point forward enough in the cargo compartment to permit static lines to enter completely into the aircraft. |

| |
|---|
| 2. Insert the other end of the strap from the bottom up, making a "U" around the static lines. |
| 3. Pull the strap forward to retrieve the static lines into the aircraft. Loadmasters may require assistance to pull the strap forward. |

**Table A2.7. Manual Static Line Retrieval Procedures (Ramp and Door) (T-1).**

| ***NOTE:*** If the static line retriever fails following a combination/tailgate drop, use the following procedures using the Prusik Knot (see **Figure A2.1.**). |
|---|
| 1. Take a 30 inch piece of 1/2-inch tubular nylon cord that is tied in a loop. Loop the cord around the static line retriever winch cable. Use a minimum of three wraps around the retriever cable to ensure locking of the 1/2-inch tubular nylon cord. |
| 2. Pull to tighten the knot around the retriever winch cable to prevent slipping. Attach the hook end of a 5,000 lb. tie-down strap into the loop's end and pull in the static lines. The 1/2-inch tubular nylon cord will remain locked in place under tension. |
| 3. More than one 1/2-inch tubular nylon cord may be attached to the winch cable using the Prusik Knot to facilitate static line retrieval. The Prusik Knot may be adjusted up or down the cable as required. The knot will not slip as long as it is wrapped tightly with a minimum of three turns (more wraps equal more friction), and tension is applied. |
| 4. To prevent cutting the 1/2-inch tubular nylon cord with the hook on the 5,000 lb. tie-down strap, a carabineer may be attached to the 1/2-inch tubular nylon cord loop and the hook attached to carabineer. |

**Figure A2.1. Prusik Knot.**



**A2.10. Container Delivery System (CDS) Airdrop Checklist (Loadmaster).** This loadmaster checklist is used for deployment of CDS, high altitude CDS, I-CDS, JPADS CDS loads either separately or in combination with personnel. Loadmasters will thoroughly pre-brief verbal/visual signals and establish coordinated task prior to the first airdrop warning.

***NOTE:*** Items marked by an asterisk "*****" are steps specific to JPADS (Guided/Improved) deployments.

**TWENTY-MINUTE CHECKLIST**

*LOADMASTER CDS AIRDROP*

1. **"CREW, TWENTY-MINUTE WARNING"** (N)
2. **"TWENTY-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

3. Jumpmaster – Alerted (As required)

***WARNING:*** **(T-1)** Ensure all personnel not involved with the airdrop remain seated forward of all parachutists with seat belts fastened and headgear donned, if required.

4. Helmet and Oxygen Mask– **"ON"** (As required) (P)(CP)(N)(AMSS)(LM)(E)

5. Helmet – On

***NOTE:*** (T-1) When oxygen is not required, the loadmaster(s) will don their helmet IAW MAJCOM directives.

"*"6. GPS-RTS (if required) – **"ON"** (LM)

7. Alternate Forward Barrier – Checked (Not required for CRRC)

8. Bundle Marker Lights – Activated (As required)

9. Bundle Rigging – Checked

   a. Static Line – Connected

   b. Gate Tension – Checked

   c. Forward Barrier – Checked (CRRC)

10. Static Line Retriever Cable and Knife – Checked (As required)

11. Static Line Retriever and Cable – Safety tied and checked (As required)

***NOTE:*** Safety tie the static line retriever IAW instructions in T.O. 1C-130A-9.

"*"12. Autonomous Guidance Units (AGU) (If required) – **"ON"** (LM)

13. Anchor Cable Stops - Positioned and secured

14. Ramp ADS Support Arms – Checked

15. LPU's (RAMZ) – Checked/Inflated (As required)

16. Cargo Compartment Lights – As required

17. Twenty-Minute Checks – **"COMPLETE"** (LM)(E)

**TEN-MINUTE CHECKLIST**
*LOADMASTER CDS AIRDROP*

1. **"CREW, TEN-MINUTE WARNING"** (N)

2. **"TEN-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

3. Jumpmaster – Alerted (As required)

4. Red Lights/NVG Airdrop Caution Lights – On/Checked

5. High Altitude Checks (As required) - **"COMPLETE"** (P)(CP)(N)(AMSS)(LM)(E)

   a. Each crewmember will accomplish the following prior to calling this step complete: (T-1)

      (1) Mask – On and connected
      (2) Regulator – On/100 Percent
      (3) Mask and Hose Connection – Checked
      (4) Regulator Flow Indicator - Checked
      (5) Buddy Checks – Complete

***WARNING: (T-1)*** The "High Altitude Checks" will initially be called "Complete" during the Ten Minute Checklist and prior to reaching a cabin altitude of 10,000 feet. The checks will be silently re-accomplished every 5,000 feet above a 10,000-foot cabin altitude. When above 20,000-foot cabin altitude, accomplish this check every 15 minutes. Above 30,000 feet, accomplish every 5 minutes.

***NOTE: (T-1)*** If an oxygen console is used, the loadmaster(s) will be stationed aft of it to perform in-flight duties. The Physiology Technician (PT) will be on interphone and normally forward of the oxygen console, if used, to perform in-flight duties. This arrangement will provide a buddy

system to check everyone on oxygen. Loadmasters and physiological crewmembers will brief verbal and visual signals that will be used throughout the mission.
***NOTE: (T-1)*** If climbing above 10,000 feet MSL, all personnel will don their helmet, mask, and set oxygen regulators to 100 percent. Parachutists may operate without the supplemental oxygen during unpressurized flight up to 13,000 feet MSL provided the elapsed time above 10,000 feet MSL does not exceed 30 minutes per sortie. Under circumstances other than these, jumpers will use supplemental oxygen. When supplemental oxygen is required for parachutists, a check of the oxygen console, connections, pressure, and quantity is required. The loadmaster will confirm that the cargo compartment crewmembers have completed this action by receiving a thumb up indication from each person.

6. High Altitude CDS Safety Pins – Removed (As required)

***NOTE:*** On CDS loads rigged for High Altitude, remove safety pins on all timer elements for loads to be dropped on this pass.

7. Restraint – Removed

***NOTE:*** **(T-2)** The 5,000 lb strap around the forward end of the forward platform will not be removed for CRRC.

***NOTE:*** (T-2) When a 5,000 pound capacity tiedown strap is used to provide forward restraint and tension on the release gate (due to bundle positioning precluding contact with the forward barrier, or when utilizing the alternate CDS rigging) the 5,000 pound capacity strap will not be removed.

"*"8. All AGU Control Panels (If required) – Checked

A. *FIREFLY/MICROFLY:* "Ready to Fly" on LCD denotes GPS Lock

***NOTE:*** (T-2) The Loadmaster will check the AGU control panel after the navigator/PAD operator has called the mission data transfer "complete".

"*"9. AGU Status (If required) – **"READY "** (or condition) (LM)

10. Emergency Restraint Straps – Positioned

11. All Personnel – Forward of Load

12. Restraint Harness/Parachute – On/Adjusted/Attached

***NOTE:*** For combination drops ensure safety personnel have parachutes or restraining harnesses on.

13. Restraint Shuttle (some airplanes) – Positioned/Connected

14. Ten Minute Checks – **"COMPLETE"** (LM)(E)

**SIX-MINUTE ADVISORY**
*LOADMASTER CDS AIRDROP*

***NOTE:*** Required for personnel and combination drops only.

1. **"CREW, SIX-MINUTE ADVISORY"** (N)

2. **"SIX-MINUTE ADVISORY ACKNOWLEDGED LM"** (LM)

3. Jumpmaster – Alerted

4. Appropriate Seats – Raised

***CAUTION:*** **(T-1)** Ensure that parachutists have secured all seats (as required) and that no part of the seat protrudes/obstructs the aisle or paratroop doors. Appropriate seats must be raised/stowed prior to the slowdown.

**SLOWDOWN CHECKLIST**
*LOADMASTER CDS AIRDROP*

***WARNING:*** **(T-1)** Prior to opening the ramp and door/paratroop door(s), all personnel aft of FS 677 will wear a restraining harness with the life-line adjusted and attached, have a parachute with the static line connected to the anchor cable, or will be secured to the aircraft with a seatbelt or using floor loading procedures. ***EXCEPTION:*** Parachutists with reserve or HGRP (high glide ratio parachute) or parachutes supplied by aircrew flight equipment may remain aft of FS 677 provided the aircraft does not descend below the prebriefed emergency bailout altitude.

***WARNING:*** **(T-1)** Paratroop door(s) and cargo door and ramp will not be open at the same time.

1. Ramp and Door –

   a. **"CLEAR TO OPEN"** (LM)(P)

   b. **"OPEN AND LOCKED"** (LM)

   c. **“INDICATES OPEN”** (E)

***WARNING:*** **(T-1)** On CRRC drops, parachutists may line up alongside the load but no further aft than the forward most static line on the CRRC. Jumpers will not move aft of FS 737 until the load starts to move.

***WARNING:*** **(T-2)** If the cargo door and ramp fail to operate normally or the mission dictates, the loadmaster may operate them from the aft control panel upon clearance from the pilot. Ensure that the restraint harness life-line is attached to a point to preclude exiting the aircraft prior to proceeding aft to operate the cargo door and ramp controls.

***CAUTION:*** **(T-1)** Ensure the aft anchor cable supports are raised and the cargo door and ramp area is clear prior to giving the "Clear to Open" call.

***NOTES:*** *(T-2)* The loadmaster will ensure all personnel are aware the doors are going to be opened. The flight engineer will open the ramp and door at 150 KIAS after receiving clearance to open from the loadmaster and pilot, and will report "Indicates Open" when the ramp and door light illuminate.

2. Aft Anchor Cable Support(s) – Lowered (As required)

***WARNING:*** **(T-2)** From this point on, the loadmaster will not position his hand near the retriever winch switches. Failure to comply with this may result in early release of the load.

***CAUTION:*** **(T-1)** Lower the aft anchor cable supports arm(s) only after the flight engineer states, "Indicates Open."

***NOTE*:** Lower the cable when tailgating for personnel.

3. Restraint Shuttles – Positioned (Some airplanes)

***WARNING: (T-2)*** The shuttle will not be moved aft until after the ramp is lowered.

4. Slowdown Checklist – **"COMPLETE"** (LM)(E)

***WARNING:*** **(T-2)** If the drop is aborted after completion of the Slowdown Checklist, request closure of the ramp and door from the flight deck, after ensuring the aft anchor cable supports are raised.

## TWO-MINUTE WARNING

*LOADMASTER CDS AIRDROP*

***NOTE:*** Required for High Altitude Personnel Airdrops only.

1. **"CREW, TWO-MINUTE WARNING"** (N)

2. **" TWO-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

3. Jumpmaster – Alerted and Jumpers Positioned (As Required)

***NOTE:*** **(T-2)** The jumper(s) will disconnect from the console oxygen and be positioned.

4. Two-Minute Checks – **"COMPLETE"** (LM)

## ONE-MINUTE WARNING

*LOADMASTER CDS AIRDROP*

1. **"CREW, ONE-MINUTE WARNING"** (N)

2. **" ONE-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

3. Jumpmaster – Alerted (As required)

4. Static Line Retriever Cable Compression Spring – Seated (As required)

***NOTE:*** **(T-2)** Failure to ensure the compression spring is fully seated in the spring retainer cup may cause the winch to inadvertently cut off (Western Gear).
"*"5. **"GPS FOM, STATE READING"** (N)
***NOTE:*** The navigator will make this call for JPADS/I-CDS drops only.

6. One-Minute Checks – **"COMPLETE"** (LM)

## RELEASE POINT CHECKLIST

*LOADMASTER CDS AIRDROP*

***NOTE:*** **(T-1)** Standard safety precautions apply when conducting airdrops. Keep working area clear, monitor interphone cords to prevent entanglement, and secure loose objects, etc. If requested/prebriefed, observe jumpers exit and assist jumpmaster/jumper as required. Five seconds prior to arrival at the release point, the navigator will state "5 Seconds." If all preceding checks are not complete by the "5 Seconds" call, a "No Drop" will be called.

1. **"GREEN LIGHT"** (N)

2. **"ON"** (P/CP)

3. Static Line Retriever Rewind Switch – Activated

***WARNING:*** **(T-2)** Loadmasters will not position themselves in the direct line of travel of the retriever cable and guillotine knife to preclude being struck in the event of recoil at gate release.

***WARNING:*** **(T-2)** If the airdrop is aborted or if the gate fails to cut after three seconds, release the static line retriever winch switch, raise the anchor cable supports and request closure of the ramp and door from the flight deck.

***NOTE:*** Verify the Green Light is on

***NOTE:*** Upon hearing the oral signal and seeing the green light illuminate, release the bundle by manually cutting the gate or activate the static line retriever rewind switch for approximately three seconds.

***NOTE:*** If the static line retriever fails at "Green Light", perform a manual gate cut if authorized.

4. **"GATE RELEASED"** (or state condition) (LM)

5. Alternate Forward Barrier – Removed (As required)

***WARNING: (T-2)*** When tailgating parachutists following single stick CDS, the loadmaster will immediately remove the alternate forward barrier after bundle(s) exit.

***WARNING:*** **(T-2)** Equipment static lines will be retrieved or cut prior to airdropping MFF personnel.

6. **"LOAD CLEAR"** (or condition) (LM)

7. **"RED LIGHT"** (N)

8. **"ON"** (P/CP)

9. Jumpmaster/Safety - Notified (As required)

## <u>COMPLETION OF DROP CHECKLIST</u>
*LOADMASTER CDS AIRDROP*

***NOTE:(T-1)*** This checklist will be initiated at the "Red Light" command or by a "No Drop" call.

1. Static Line(s) – Retrieved/Cut

***CAUTION:*** **(T-2)** Before retrieving static lines, allow a few seconds for the lines to wrap together.

***NOTE:*** An immediate turn after "Load Clear" may cause static lines to become entangled on the side of the aircraft.

2. Anchor Cable Support(s) – Raised (As required)

3. Restraint Shuttle (some airplanes) – Positioned

***WARNING: (T-2)*** The shuttle must be moved forward of the center anchor cable support before raising the ramp to close.

4. Ramp and Door– **"CLOSED AND LOCKED"** (LM)

***WARNING:*** **(T-1)** The loadmasters will ensure that the life line is attached to a point that will preclude exiting the aircraft, prior to proceeding aft to operate the cargo ramp and door controls.

***CAUTION:*** **(T-2)** The loadmaster will close the ramp and door from the aft control panel as soon as the area is clear of all obstructions.

***NOTE:*** Visually check the ramp and door locks after closing.

5. Drop Checks - **"COMPLETE"** (LM)(E)

***NOTE*:** (T-2) Loadmasters will run the AIRDROP CLEANUP Checklist immediately following completion of this checklist.

**A2.11. CDS Malfunction Checklist.** See **Chapter 17** for amplifying guidance and information.

**CDS MALFUNCTION CHECKLIST**

1. Pilot Notified – **"MALFUNCTION" (**Provide a brief description) (LM)

***WARNING:*** **(T-2)** After being notified of a malfunction, the pilot will extend additional flaps and establish a power setting to lower the aircraft pitch attitude and aid in keeping the potentially loose load from exiting the aircraft.

***WARNING****:* Avoid creating an excessive nose down attitude that causes the malfunctioning load to slide back toward the front of the aircraft.

2. Parachutists – Notified (As required) to remain forward and clear of the load.

3. Aft Anchor Cable Supports – Raised (As required).

4. **"CLEAR TO CLOSE RAMP AND DOOR"** (LM)

***WARNING:*** **(T-1)** The loadmaster will ensure that the restraint harness lifeline is attached to a point no further aft than FS 677 prior to proceeding aft to operate the ramp and door controls.

***CAUTION:*** **(T-1)**If the containers are jammed in the ramp area, the loadmaster will notify the engineer to stop closing action when the cargo door is released from the uplocks. After the load is secured and the ramp area is clear, the loadmaster will close the ramp and door from the aft control panel (if possible).

***NOTE:*** Notify the engineer when closed and locked.

5. Bundle(s) – Secured

6. Pilot Notified – **"MALFUNCTION CHECKS COMPLETE"** (LM)

7. Accomplish the COMPLETION OF DROP Checklist.

**A2.12. (T-1) Dropsonde Checklist (Loadmaster).** Dropsonde airdrops will be conducted using zero percent flaps, between 170 and 180 KIAS, using only the cargo door. This configuration will prevent the dropsonde from striking the tail of the aircraft. Loadmasters will open the cargo door from the aft control panel for dropsonde airdrops.

***CAUTION:*** (T-1) When tactical situation allows, open the cargo door before climbing above 15,000 feet. When airdropping following a high altitude transition (e.g. extended high level flight to a high altitude airdrop) above 10,000 feet MSL, turn on the auxiliary pump prior to depressurization and set aircraft depressurization rate to 1,000 FPM. This time must be factored into the drop sequence to ensure the aircraft is completely depressurized prior to opening the cargo door. If the auxiliary pump stalls during cargo door activation (indicated by a loud audible whine or a pressure reading below 1,000 PSI), allow system pressure to recover by stopping opening or closing action. During unexpected delays it is recommend the auxiliary pump be turned off to prevent overheating. The risk of pump overheating must be weight against the need to rapidly close the cargo door and evade threats.

## TWENTY-MINUTE CHECKLIST

*LOADMASTER DROPSONDE AIRDROP CHECKLIST*

1. **"CREW, TWENTY-MINUTE WARNING"** (N)

2. **"TWENTY-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

3. Jumpmaster – Alerted (As required)

***WARNING: (T-1)*** Ensure all personnel not involved with the airdrop remain seated forward of all parachutists with seat belts fastened and headgear donned, if required.

4. Helmet and Oxygen Mask– **"ON"** (As required) (P)(CP)(N)(AMSS)(LM)(E)

5. Helmet – On

***NOTE:*** (T-1)When oxygen is not required, the loadmaster(s) will don their helmet IAW MAJCOM directives.

6. UHF-DRS – **“ON”** (LM)

**NOTE: (T-2)** To ensure sufficient time to acquire GPS lock, the GPS Retransmission System (GPS-RTS) and UHF Dropsonde Receive System (UHF-DRS) will be turned on as soon as possible after takeoff. The UHF-DRS Ethernet light must be flashing green before turning on the JPADS laptop.

7. GPS-RTS – "**ON**" (LM)

8. Anchor Cable Stops - Positioned and secured

9. Cargo Compartment Lights – As required

10. Twenty-Minute Checks – **"COMPLETE"** (LM)(E)

## TEN-MINUTE CHECKLIST

*LOADMASTER DROPSONDE AIRDROP CHECKLIST*

1. **"CREW, TEN-MINUTE WARNING"** (N)

2. **"TEN-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

3. Jumpmaster – Alerted (As required)

4. Red Lights/NVG Airdrop Caution Lights – On/Checked

5. Airborne Guidance Units (AGU) (JPADS only) – **"ON"** (LM)

   a. FIREFLY/MICROFLY – On/Checked

6. High Altitude Checks (As required) - **"COMPLETE"** (P)(CP)(N)(AMSS)(LM)(E)

   a. Each crewmember will accomplish the following prior to calling this step complete:

      (1) Mask – On and connected

      (2) Regulator – On/100 Percent

      (3) Mask and Hose Connection – Checked

      (4) Regulator Flow Indicator - Checked

      (5) Buddy Checks – Complete

***WARNING:*** **(T-1)** The "High Altitude Checks" will initially be called "Complete" during the Ten Minute Checklist and prior to reaching a cabin altitude of 10,000 feet. The checks will be silently re-accomplished every 5,000 feet above a 10,000-foot cabin altitude. When above 20,000-foot cabin altitude, accomplish this check every 15 minutes. Above 30,000 feet, accomplish every 5 minutes.

**NOTE: (T-1)** If an oxygen console is used, the loadmaster(s) will be stationed aft of it to perform in-flight duties. The Physiology Technician (PT) will be on interphone and normally forward of the oxygen console, if used, to perform in-flight duties. This arrangement will provide a buddy system to check everyone on oxygen. Loadmasters and physiological crewmembers will brief verbal and visual signals that will be used throughout the mission.

**NOTE: (T-1)** If climbing above 10,000 feet MSL, all personnel will don their helmet, mask, and set oxygen regulators to 100 percent. Parachutists may operate without the supplemental oxygen during unpressurized flight up to 13,000 feet MSL provided the elapsed time above 10,000 feet MSL does not exceed 30 minutes per sortie. Under circumstances other than these, jumpers will use supplemental oxygen. When supplemental oxygen is required for parachutists, a check of the oxygen console, connections, pressure, and quantity is required. The loadmaster will confirm that the cargo compartment crewmembers have completed this action by receiving a thumb up indication from each person.

7. Dropsondes – **“ON”**

A. On/Off Tool(s) inserted

***CAUTION:*** To prevent interference of the dropsondes acquiring GPS lock, do not hold multiple dropsondes closer than 18 inches while powered on.

***NOTE:*** (T-2) Dropsondes should not be turned on until the GPS-RTS has completed power-up/BIT check (steady green light). Up to 5 minutes may be required to complete the power-up/BIT check.

8. Drop Sonde Status –

A. **“SERIAL #______, FREQUENCY_____”** (LM)

B. **“VERIFIED”** (N/PO)

***NOTE:*** (T-2) On dropsondes labeled with both an ID and serial number, loadmasters will only relay the ID number to the navigator/PAD operator.

9. All Personnel – Forward of Load

10. Restraint Harness/Parachute – On/Adjusted/Attached

11. Restraint Shuttle (some airplanes) – Positioned/Connected

12. Dropsonde GPS Locked – Checked

13. Ten Minute Checks – **"COMPLETE"** (LM)(E)

## <u>SLOWDOWN CHECKLIST</u>

*LOADMASTER DROPSONDE AIRDROP CHECKLIST*

***WARNING:*** **(T-1)** Prior to opening the cargo door, all personnel aft of FS 677 will wear a restraining harness with the life-line adjusted and attached, have a parachute with the static line connected to the anchor cable, or will be secured to the aircraft with a seatbelt or using floor loading procedures. ***EXCEPTION:*** Parachutists with reserve or HGRP (high glide ratio parachute) or parachutes supplied by aircrew flight equipment may remain aft of FS 677 provided the aircraft does not descend below the prebriefed emergency bailout altitude.

***WARNING:*** Paratroop door(s) and cargo door and ramp will not be open at the same time.

1. Cargo Door –

a. **"CLEAR TO OPEN"** (P)

b. **"OPEN AND LOCKED"** (LM)

***CAUTION:*** **(T-2)** Ensure the aft anchor cable supports are raised and the cargo door and ramp area is clear prior to giving the "Clear to Open" call.

***CAUTION:*** (T-2) The loadmaster will operate the cargo door from the aft control panel for all dropsonde airdrops. The pilot will not call "Clear to Open" until the aircraft is below 185 KIAS for cargo door.

***NOTE:*** The loadmaster will ensure all personnel are aware the doors are going to be opened.

2. Restraint Shuttles – Positioned (Some airplanes)

3. Slowdown Checklist – **"COMPLETE"** (LM)(E)

***NOTE:*** **(T-2)** If the drop is aborted after completion of the Slowdown Checklist, the loadmaster will close the cargo door after ensuring the cargo door and ramp area is clear.

**ONE-MINUTE WARNING**

*LOADMASTER DROPSONDE AIRDROP CHECKLIST*

1. **"CREW, ONE-MINUTE WARNING"** (N)

2. **" ONE-MINUTE WARNING ACKNOWLEDGED LM"** (LM)

3. DropSonde Shunt(s) – Pulled

4. On/Off Tools – Removed

5. Parachute-securing Velcro Straps – Removed

6. One-Minute Checks – **"COMPLETE"** (LM)

**RELEASE POINT CHECKLIST**

*LOADMASTER DROPSONDE AIRDROP CHECKLIST*

***NOTE:*** **(T-1)** Standard safety precautions apply when conducting airdrops. Keep working area clear, monitor interphone cords to prevent entanglement, and secure loose objects, etc. Five seconds prior to arrival at the release point, the navigator will state "5 Seconds." If all preceding checks are not complete by the "5 Seconds" call, a "No Drop" will be called.

1. **"GREEN LIGHT"** (N)

2. **"ON"** (P/CP)

***NOTE:*** **(T-2)** Upon hearing the oral signal and verifying the Green Light is on illuminated, loadmasters will release the dropsonde from the corner of the cargo ramp, which will be in the fully closed position. Release the dropsonde at a 45-degree angle away from the corner of the ramp.

3. **"LOAD CLEAR"** (or condition) (LM)

4. **"RED LIGHT"** (N)

5. **"ON"** (P/CP)

**COMPLETION OF DROP CHECKLIST**

*LOADMASTER DROPSONDE AIRDROP CHECKLIST*

***NOTE:*** **(T-1)** This checklist will be initiated at the "Red Light" command or by a "No Drop" call.

1. Restraint Shuttle (some airplanes) – Positioned

2. **"CARGO DOOR CLOSED AND LOCKED"** (LM)

***CAUTION:*** **(T-2)** The loadmaster will close the ramp and door from the aft control panel as soon as the area is clear of all obstructions.

***NOTE:*** Visually check the door locks after closing.

3. Secondary Dropsondes – OFF (As required)

4. Drop Checks - **"COMPLETE"** (LM)(E)

***NOTE*****: (T-2)** Loadmasters will run the AIRDROP CLEANUP Checklist immediately following completion of this checklist.

**A2.13. Airdrop Cleanup Checklist (Loadmaster).** (T-2) Loadmasters will complete this checklist immediately following the COMPLETION OF DROP checklist for all airdrop deployments.

***NOTE:*** Items marked by an asterisk "*****" are steps specific to JPADS (Guided/Improved) deployments.

**AIRDROP CLEANUP CHECKLIST**

1. Multiple Rigging – Complete (As required)

***NOTE:*** Utilize DD Form 1748 to accomplish multiple rigging if required.

2. Alternate Forward Barrier – Removed (As required)

3. Static Line Retriever Cable – Rewind/Repositioned (As required)

4. Loose Equipment – Secure

"*"5. UHF-DRS and GPS-RTS – Off (As Required)

"*"6. AGUs– Off (As required)

***NOTE:*** Turn off all AGUs not to be dropped in order to conserve battery life.

7. Oxygen Regulators and Consoles – Set (As required)

8. Cargo Compartment – Secure

## Attachment 3

## AMPLIFIED SEARCH AND RESCUE CHECKLIST

### A3.1. Search and Rescue Checklist (Pilot/Crew).

A3.1.1. **(T-1)** The pilot will initiate this checklist by calling for the "Pre-Search Checklist" or "Pre-Deployment Checklist" as appropriate for the maneuver being flown.

A3.1.2. Run the COMBAT ENTRY Checklist as required. Items previously run on the COMBAT ENTRY Checklist need not be challenged and/or re-accomplished.

A3.1.3. **(T-1)** Prior to takeoff, the pilot will ensure the crew has thoroughly reviewed all emergency procedures. Loadmasters will thoroughly pre-brief verbal/visual signals and establish coordinated task prior to running the Pre-Deployment Checklist.

**PRE-SEARCH/DEPLOYMENT CHECKLIST**

*PILOT/CREW*

***WARNING:*** Keep turns below 300 feet AGL to a minimum.

1. **"PRE-SEARCH/PRE-DEPLOYMENT CHECKLIST"** (P)

2. **"PRE-SEARCH/PRE-DEPLOYMENT CHECKLIST ACKNOWLEDGED LM**" (LM)

3. Search Data - Computed (E)

   a. Refer to the Aircraft Performance Manual.

***NOTE:*** (T-1) Wings level and 30 degree bank stall speeds will be computed.

4. Crew Briefing – **"COMPLETE"** (P)

   a. Brief/update applicable items from Search and Rescue Briefing Guide. See AFI 11-2HC-120V3 CL-1.

5. Helmet and Oxygen– **"ON"** (As required) (P)(CP)(N)(AMSS)(LM)(E)

***NOTE:*** ***(T-1)*** If climbing above 10,000 ft MSL, all personnel will don their helmet and mask and set oxygen regulators to 100 percent.

6. Aircraft Oxygen System – **"CHECKED"** (CP)

   a. (T-1) The copilot will check both oxygen system indicators to ensure sufficient oxygen is available for intended operations and that no abnormal indications exist.

7. Altimeters – **"SET, STATE SETTING"** (P)(CP)(N)

***WARNING:*** **(T-1)** If search is conducted some distance from a known altimeter setting, take precautions to ensure that the aircraft does not descend to a dangerously low altitude. Obtain forecast altimeter setting upon departure or en route for the area of operation. Set the altimeter this setting and crosscheck against the radar altimeter.

8. Radar Altimeter – **"SET, STATE SETTING"** (P)(N)

9. IFF/ETCAS – **"SET, STATE SETTING"** (CP/E)

a. Set IFF/ETCAS to TA, NORM, or STBY for airdrop operations depending on tactical situation and MAJCOM/theater guidance.

10. Pressurization – Depressurizing/As required (E)

***CAUTION:*** **(T-1)** Advise the crew of pressurization and setting and exercise caution not to open doors prior to depressurizing.

11. Lights – **"SET"** (P)(CP)(N)(AMSS)(LM)(E)

a. Interior lights – Set

b. Exterior lights – Set

12. NVGs – **"ON/READY"** (As required)(State condition) (P)(CP)(N)(AMSS)(LM)(E)

13. Flare Launcher Control Panel (some airplanes) – **"ARMED/SAFE"** (As required) (E/CP)(Scanner)

a. If required, the loadmaster will load the pyrotechnics needed for the mission prior to the aircraft being pressurized. (T-2)

b. The loadmaster will confirm with the pilot, copilot, engineer, and scanners the pyrotechnic load by type and flare tube numbers. (T-2)

c. When this item is required, the loadmaster will place the Deactivation switch on the Winch Operator's Control panel to the ACTIVATE position. The copilot/flight engineer and scanners will place their flare launcher control panel switches to the ARM position and check the SYSTEM ARMED light to ensure the system has been activated. (T-2)

d. The system is armed and operated by the copilot, flight engineer, or scanner(s) as directed by the aircraft commander.

14. High Altitude Checks (As required) - **"COMPLETE"** (P)(CP)(N)(AMSS)(LM)(E)

a. Each crewmember will accomplish the following prior to call this step complete: (T-1)

(1) Mask – On and connected
(2) Regulator – On/100 Percent

(3) Mask and Hose Connection – Checked

(4) Regulator Flow Indicator - Checked

***WARNING: (T-1)*** The "High Altitude Checks" will initially be called "Complete" during the Pre-search/Pre-Deployment Checklist and prior to reaching a cabin altitude of 10,000 feet. When above 20,000-foot cabin altitude, accomplish this check every 15 minutes. Above 30,000 feet, accomplish every 5 minutes.

***NOTE: (T-1)*** If climbing above 10,000 feet MSL, all personnel will don their helmet, mask, and set oxygen regulators to 100 percent. Parachutists may operate without the supplemental oxygen during unpressurized flight up to 13,000 feet MSL provided the elapsed time above 10,000 feet MSL does not exceed 30 minutes per sortie. Under circumstances other than these, jumpers will use supplemental oxygen. When supplemental oxygen is required for parachutists, a check of the oxygen console, connections, pressure, and quantity is required. The loadmaster will confirm that the cargo compartment crewmembers have completed this action by receiving a thumb up indication from each person.

15. Aux pump – **"ON"** (As required) (CP)

16. Red Light - **"ON"** (JMD/Pararescue Deployment Only) (P/CP)

17. Flaps - **"SET, STATE SETTING"** (P/CP/E)

a. Flap setting normally will be 50 percent for search operations but may be less if required for airspeed, fuel, etc. Refer to the Aircraft Performance Manual for specific search configuration flap settings. (T-2)

b. For rescue equipment or pararescue deployment, set flaps to 50 percent at aircraft gross weights below 140,000 lbs and 70 percent at or above 140,000 lbs.

18. Air Conditioning Panel – NO PRESS/As required (E)

19. Pressurization – **"DEPRESSURIZED"** (If required) (E)

***WARNING: (T-1)*** Ensure airplane is fully depressurized before opening any door. Failure to do so may result in airplane damage and/or personal injury.

20. Air Deflector Doors (If Required) – **"OPEN"** (P/CP)

***NOTE*****:** Once air deflector doors are called open by the pilot or copilot, this automatically clears the loadmaster to open the paratroop door(s).

21. "**PARATROOP DOOR(S), OPEN AND LOCKED"** (As required) (LM)

***WARNING:*** **(T-1)** Under no circumstances will a paratroop door and ramp and door be open at the same time when parachutists are involved. If the bundle/equipment dropped from the ramp requires spotting procedures from an open paratroop door, ensure life lines are properly adjusted for both exits.

22. Ramp and Door (If required) –

a. **"CLEAR TO OPEN"** (LM)(P)

b. **"OPENED AND LOCKED"** (LM)

c. **"INDICATES OPEN"** (E)

***WARNING: (T-2)*** If the cargo ramp and door fail to operate normally or the mission dictates, the loadmaster may operate them from the aft control panel upon clearance from the pilot and once the lifeline is attached and adjusted.

***CAUTION*****: (T-1)**The flight engineer will monitor and ensure the ramp and door open light on the ADS panel remains illuminated for the entire drop. Failure of the light to illuminate or remain illuminated constitutes a no drop condition.

***NOTES*****: (T-2)** During manual parachute flare, streamer, marker smoke, or sea-dye delivery, and rescue airdrops using the Search/Deployment Checklist from the ramp and door, the loadmaster will open and close the cargo door and ramp.

The flight engineer will open the ramp and door at 150 KIAS after receiving clearance to open from the loadmaster and pilot, and will report "Indicates Open" when the ramp and door light illuminate. (T-2)

23. Pre-Search/Deployment Checks **– "COMPLETE"** (LM)(E)

a. The flight engineer will read this step as "Pre-Search Checks" or "Pre-Deployment Checks" as appropriate for the operations being conducted. (T-2)

## EQUIPMENT DEPLOYMENT CHECKLIST

*(MA-1 KIT, PARABUNDLE, AND FREEFALL)*
*PILOT/CREW*

***NOTES: (T-2)*** The pilot will initiate this checklist by briefing the pattern and delivery to be flown.

If the Pre-Search/Deployment Checklist has already been accomplished and the aircraft configuration will not be changed for the delivery pattern, e.g., flap settings and/or doors, rescue equipment drops can commence immediately. (T-2)

On each pattern flown, the pilot should call downwind, turning base, turning final, and the type of deployment pattern being flown (e.g. "Turning base for MA-1 kit," "Turning final for parabundle"). The loadmaster will acknowledge the pilot's calls for situational awareness and crew coordination. (T-2)

1. **"30 SECONDS TO TARGET"** (P)

2. **"10 SECONDS TO TARGET"** (P)

3. **"TARGET IN SIGHT"** (Parabundle Only) (LM)

4. Pattern Corrections (Parabundle Only; 10 left/10 right etc.)

5. **"LOAD CLEAR"** (LM)

**PERSONNEL DEPLOYMENT CHECKLIST**
*(JMD/PJMD/RAMZ/ATV)*
*PILOT/CREW*

1. **"PERSONNEL DEPLOYMENT CHECKLIST"** (P)

***NOTE: (T-1)*** This checklist will be used for jumpmaster directed (JMD) airdrops and pararescue deployment (PJD)/equipment airdrops utilizing the fixed, moving, and crosswind target patterns. The pilot will initiate this checklist by calling for the "Personnel Deployment Checklist."

***NOTE: (T-1)*** No less than 2 minutes out from the release point, the loadmaster will allow the jumpmaster
access to the door to begin spotting procedures. When the jumpmaster is off interphone, the loadmaster will relay all visual corrections given by the jumpmaster to the pilot.

***NOTE: (T-1)*** The jumpmaster may spot from the aircraft ramp or a paratroop door; however, the aircraft ramp and paratroop door(s) will not be opened simultaneously during personnel airdrops.

2. **PERSONNEL DEPLOYMENT CHECKLIST ACKNOWLEDGED LM"** (LM)

3. Turn to Final

4. **"CREW, ONE-MINUTE WARNING"** (P)

***WARNING:*** **(T-1)** If any crewmember calls "No Drop" after the "One Minute Warning" call, no deployment will be made and the deployment phase of the checklist will be re-initiated. Upon hearing a "No Drop" call, the PM will turn the red light on and, along with the loadmaster, acknowledge the "No Drop." For a RAMZ/ATV bundle "No Drop," avoid abrupt maneuvers and make all turns as level as possible as the equipment is restrained by the release gate only at this point.

5. **"SAFETY CHECKS COMPLETE"** (LM/JM)

***NOTE: (T-2)*** Pararescuemen or jumpmaster will run their Safety Checks; the loadmaster is responsible for accomplishing all other appropriate checklists and overall safety in the cargo compartment. When either the loadmaster or jumpmaster responds "Safety Check Complete," this indicates that both the personnel/ equipment and safetyman checklists have been completed on all jumpers exiting on this pass.

6. **"CLEAR TO JUMP"** (P)

***NOTE:*** When the pilot responds "Clear to Jump," this indicates that all conditions are favorable for personnel deployment upon reaching the planned/desired exit point.

7. Green Light – **"ON"** (P/CP)

***NOTE: (T-2)*** The PM will turn on the green light. Perform this step for live passes only. For streamer/spotter or observations, leave the red light turned on.

8. Fly streamer to Target (As required) (P)

***NOTE: (T-2)*** When using PJ JMD Fixed or Moving Target Patterns, make minor heading changes to pass over spotter chute and the target on a direct line. Establish Drift Correction Prior to passing over the Spotter Chute. The JM will reverse count over the target.

9. Fly JM Directed Course (As required) (P)

10. Release jumpers and/or equipment (JM)

***NOTE*: (T-2)** At the completion of the reverse count (PJ fixed or moving target pattern only) or when the aircraft is in a direct line with the target and spotter chute (PJ crosswind target pattern drop), the jumpmaster will release the jumpers and/or equipment.

***NOTE*: (T-2)** For JMD airdrops where the JM is verbally directing the aircraft, the JM will release the jumpers when reaching the release point.

11. **"GATE RELEASED"** (or state condition) (As required) (LM)

12. **"LOAD CLEAR"** (or state condition) (LM)

13. **"RED LIGHT"** (N)

***NOTE*: (T-2)** The navigator will call for the red light to be turned on upon hearing the "LOAD CLEAR" call or for any safety of flight issue and/or emergency.

14. **"ON"** (P/CP)

15. After Jumper(s) Clear the Aircraft –
Turn to observe the accuracy of the drop (As required)

## POST-SEARCH/POST-DEPLOYMENT CHECKLIST

*PILOT/CREW*

1. **"POST-SEARCH/POST-DEPLOYMENT CHECKLIST"** (P)

***NOTE*: (T-2)** Post Search/Post Deployment Checklist. For multiple drops, the Post-Search/Deployment Checklist is not required until after completion of the last drop, but each pattern and delivery will be briefed. As a minimum, brief the type of equipment to be delivered, delivery method (shape, relationship to wind, etc.), altitudes, airspeeds, commands to be used, and required actions for malfunctions.

***NOTE*: (T-2)** This checklist must be accomplished prior to initiating a non-search/deployment checklist.

***NOTE*: (T-2)** Accomplish applicable steps of the Post-Search/Deployment and re-accomplish the Pre-Search/Deployment Checklist when changing the aircraft or door configuration.

2. **"POST-SEARCH/POST-DEPLOYMENT CHECKLIST ACKNOWLEDGED LM"** (LM)

3. Ramp and Door/Paratroop Door(s) (As required) – **"CLOSED AND LOCKED"** (LM)

a. The loadmaster will close the ramp and door.

b. If both the cargo ramp and door and a paratroop door were open for loadmaster-directed rescue equipment airdrops, close the cargo ramp and door first, then the paratroop door.

4. Air Deflector Doors – **"CLOSED AND OFF"** (P/CP)

a. The PM the aircraft will close the air deflector doors and return the switch to Off.

5. Flaps – **"SET, STATE SETTING"** (P/CP/E)

6. Red Light – **"OFF"** (Personnel deployment only) (P/CP)

7. Aux Pump – **"OFF"** (As required) (CP)

8. Flare Launcher Control Panel (some airplanes) –
**"SAFE/ARMED"** (As required) (E/CP)(Scanner)

a. The engineer will position the ARM/SAFE switch as required for the mission to be performed.

b. The loadmaster will deactivate the system and will check the deactivate light to ensure all panels are safe. ***NOTE*****: (T-2)**

9. Pressurization – Set (E)

a. The Flight engineer will begin pressurization as necessary. (T-1)

10. Altimeters – **"SET, STATE SETTING"** (P)(CP)(N)

11. Radar Altimeter – **"SET, STATE SETTING"** (P)(N)

12. IFF/ETCAS – **"SET, STATE SETTING"** (CP/E)

a. Set IFF/ETCAS to TA, NORM, or STBY for airdrop operations depending on tactical situation and MAJCOM/theater guidance.

13. NVGs – **"ON/OFF/READY"** (As required)(state condition) (P)(CP)(N)(AMSS)(LM)(E)

14. Lights – **"SET"** (P)(CP)(N)(AMSS)(LM)(E)

a. Interior lights – Set

b. Exterior lights – Set

15. Post-Search/Post-Deployment Checks – **"COMPLETE"** (LM)(E)

a. The flight engineer will read this step as "Post-Search Checklist" or "Post-Deployment Checklist" as appropriate for the maneuver being flown.

**A3.2. Search and Rescue Airdrop Checklist (Loadmaster). (T-2)** The pilot will initiate this checklist by calling for the "Pre-Search Checklist" or "Pre-Deployment Checklist" as appropriate for the maneuver being flown. Prior to takeoff, the pilot will ensure the crew has thoroughly reviewed all emergency procedures. Loadmasters will thoroughly pre-brief verbal/visual signals and establish coordinated task prior to running the Pre-Deployment Checklist.

**PRE-SEARCH/DEPLOYMENT CHECKLIST**
*LOADMASTER*

1. **"PRE-SEARCH/PRE-DEPLOYMENT CHECKLIST"** (P)

2. **"PRE-SEARCH/PRE-DEPLOYMENT CHECKLIST ACKNOWLEDGED LM"** (LM)

3. Helmet (and Oxygen mask) – **"ON"** (As required) (P)(CP)(N)(AMSS)(LM)(E)

***NOTE:( (T-1)*** If climbing above 10,000 ft MSL, all personnel will don their helmet and mask and set oxygen regulators to 100 percent.

4. Helmet – On

***NOTE*: (T-1)** When oxygen is not required, the loadmaster(s) will don their helmet IAW MAJCOM directives.

5. Cabin – Prepared

a. Galley Floor – Up

b. Emergency Equipment – As required

c. Loose Equipment – Stowed/Secured

d. LPUs – On (As required)

e. MA-1 Kits – Positioned/Secured

6. Aft Anchor Cable Supports – Lowered (Paratroop door exit only)

7. Anchor Cables – Attached to Center Anchor Cable Supports (Paratroop door exit only)

8. Anchor Cables Stops – Positioned and secured

9. Static Line Retriever Cable – Safety Tied and Checked (As required)

10. Retrieval Sling Assembly – Attached and Safety Tied (As required)

11. Retrieval Assist Strap (Roller Assembly) – Positioned and Secured (As required)

12. Ramp ADS Support Arms – Checked (As required)

13. Bundle/RAMZ Marker Lights/LPUs – Activated (As required)

***NOTE*: (T-2)** Prior to opening the cargo ramp and door, ensure chemlites/strobelights are activated/on and cargo chute LPUs are inflated (for training chutes only).

14. Lights – **"SET"** (P)(CP)(N)(AMSS)(LM)(E)

a. Jump Platform Lights – As required

b. Jump Light Intensity Switch – As required

***NOTE*:** For night airdrops, set the jump lights to low intensity.

c. Cargo Compartment Lights – As Required

***NOTE*: (T-2)** Set to facilitate dark adaptation; ensure the cargo compartment lights are set to dim and/or red at least 30 minutes prior to a night personnel drop (non-NVIS compatible cargo compartments).

15. NVGs – **"ON/READY"** (As required)(State condition) (P)(CP)(N)(AMSS)(LM)(E)

16. Flare Launcher – Loaded (As Required)

a. If required, the loadmaster will load the pyrotechnics needed for the mission prior to the aircraft being pressurized. **(T-2)**

17. Flare Launcher Control Panel (some airplanes) – **"ARMED/SAFE"** (As required) (E/CP)(Scanner)

b. The loadmaster will confirm with the pilot, copilot, engineer, and scanners the pyrotechnic load by type and flare tube numbers. **(T-2)**

c. When this item is required, the loadmaster will place the Deactivation switch on the Winch Operator's Control panel to the ACTIVATE position. The copilot/flight engineer and scanners will place their flare launcher control panel switches to the ARM position and check the SYSTEM ARMED light to ensure the system has been activated. **(T-2)**

d. The system is armed and operated by the copilot, flight engineer, or scanner(s) as directed by the aircraft commander.

18. Restraint Harness/Parachute – On/Adjusted/Attached

***WARNING:* (T-2)** Prior to opening the ramp and door, all personnel aft of FS 677 will wear a restraining harness with the life-line adjusted and attached, have a parachute with the static line connected to the anchor cable, or will be secured to the aircraft with a seatbelt or using floor loading procedures. ***EXCEPTION*:** Parachutists with reserve or HGRP (high glide ratio parachute) or parachutes supplied by Life Support may remain aft of FS 677 provided the aircraft does not descend below 1,000 ft AGL.

***WARNING:* (T-2)** When the static line retriever is rigged for tailgate operations, the left side personnel restraint cable will not be used.

19. Restraint Shuttle (some airplanes) – Positioned

***WARNING:*** **(T-2)** The shuttle will not be moved aft of the center anchor cable support until after the ramp is lowered.

***WARNING:*** **(T-2)** The shuttle must be moved forward of the center anchor cable support before raising the ramp to close. If both paratroop doors are opened, personnel aft of FS 677 must wear two safety lines, one connected to each side of the aircraft.

20. Appropriate Seats – Raised (As required)

***CAUTION:*** **(T-2)** Ensure that parachutists have secured all seats (as required) and no part protrudes/obstructs the aisle or paratroop doors. Appropriate seats must be raised/stowed prior to the drop.

21. High Altitude Checks (As required) – **"COMPLETE"** (P)(CP)(N)(AMSS)(LM)(E)

a. Each crewmember will accomplish the following prior to calling this step complete:

(1) Mask – On and connected

(2) Regulator – On/100 Percent

(3) Mask and Hose Connection – Checked

(4) Regulator Flow Indicator – Checked

(5) Buddy Checks – Complete

***WARNING:*** **(T-1)**The "High Altitude Checks" will initially be called "Complete" during the Pre-search/Pre-Deployment Checklist and prior to reaching a cabin altitude of 10,000 feet. The checks will be silently re-accomplished every 5,000 feet above a 10,000-foot cabin altitude. When above 20,000-foot cabin altitude, accomplish this check every 15 minutes. Above 30,000 feet, accomplish every 5 minutes.

***NOTE:*** **(T-1)** If an oxygen console is used, the loadmaster(s) will be stationed aft of it to perform in-flight duties. The Physiology Technician (PT) will be on interphone and normally forward of the oxygen console, if used, to perform in-flight duties. This arrangement will provide a buddy system to check everyone on oxygen. Loadmasters and physiological crewmembers will brief verbal and visual signals that will be used throughout the mission.

***NOTE:*** **(T-1)** If climbing above 10,000 feet MSL, all personnel will don their helmet, mask, and set oxygen regulators to 100 percent. Parachutists may operate without the supplemental oxygen during unpressurized flight up to 13,000 feet MSL provided the elapsed time above 10,000 feet MSL does not exceed 30 minutes per sortie. Under circumstances other than these, jumpers will use supplemental oxygen. When supplemental oxygen is required for parachutists, a check of the oxygen console, connections, pressure, and quantity is required. The loadmaster will confirm that the cargo compartment crewmembers have completed this action by receiving a thumb up indication from each person.

22. Red Lights – On/Checked (Personnel Deployment Only)

23. Bundle Restraint Straps – Removed

***CAUTION:*** The loadmaster will be positioned to remove aft restraint and to observe equipment and jumpers at all times. **(T-2)**

***NOTE:*** **(T-2)** Forward restraint strap may remain in place until the ramp is in the ADS position.

***NOTE***: **(T-2)** If an extended search is conducted with the ramp in the ADS position, the aft restraint strap may remain installed until the Equipment Deployment Checklist is initiated.

24. Air Deflectors (As required) – **"OPEN"** (P/CP)

***NOTE*****:** Once air deflectors are called open by the pilot or copilot, this automatically clears the loadmaster to open the paratroop door(s).

25. "**PARATROOP DOOR(S), OPEN AND LOCKED"** (As required) (LM)

***WARNING:*** **(T-2)** If an air deflector door fails to open, do not open the respective paratroop door. Notify the pilot of the problem.

***WARNING****:* **(T-2)** Under no circumstances will a paratroop door and the ramp and door be open at the same time when parachutists are involved. If the bundle/equipment dropped from the ramp requires spotting procedures from an open paratroop door, ensure life lines are properly adjusted for both exits.

***WARNING*****: (T-2)** Paratroop doors will be opened only by the loadmaster(s). After opening and locking, the safety pin will be installed.

***WARNING*****: (T-2)** Any time the paratroop doors are lowered, the jump platform will be retracted and the door lowered completely.

***NOTE:*** **(T-2)** The loadmaster will ensure all personnel are aware the doors are going to be opened.

26. Ramp and Door (As Required) –

a. **"CLEAR TO OPEN"** (P)(LM)

b. **"OPENED AND LOCKED"** (LM)

c. **"INDICATES OPEN"** (E)

***WARNING:*** **(T-2)** If the cargo door and ramp fail to operate normally or when mission dictates, the loadmaster may operate them from the aft control panel upon clearance from the pilot. Ensure the restraint harness life-line is attached to a point to preclude exiting the aircraft prior to proceeding aft to operate the cargo door and ramp controls.

***CAUTION:*** **(T-2)** Ensure the aft anchor cable supports are raised and the cargo door and ramp area is clear prior to giving the "Clear To Open" call.

***NOTE*****: (T-2)** The loadmaster will ensure all personnel are aware the doors are going to be opened.

***NOTE*****: (T-2)** The flight engineer will open the ramp and door at 150 KIAS after receiving clearance to open from the loadmaster and will report "Indicates Open" when the door and ramp light illuminate.

***NOTE*****: (T-2)** During tailgate exits, all parachutists with the exception of the jumpmaster will remain forward of the ramp hinge until the One-Minute Warning.

27. Anchor Cable Support(s) – Lowered (As required)

***WARNING:*** **(T-2)** Remove the anchor cable from retaining clips and do not secure the anchor cable in the center anchor cable support for personnel/RAMZ/ATV/Container Ramp Load (CRL) tailgate drops.

28. Door Control – Assumed by Jumpmaster/Safety

***WARNING:*** **(T-2)** [Paratroop door exits] Loadmasters will not position themselves under the center anchor cable support.

***WARNING:*** **(T-2)** Parachutist are cleared to line up along side of the forward most CRL but will not move aft of FS 737 or the forward load static line, whichever is more restrictive. For floor loaded CRL, parachutist will not move aft until the load crosses FS 737 on exit.

***NOTE:*** **(T-2)** All parachutists with the exception of the jumpmaster/safety will remain forward of the ramp hinge until after the One-Minute Warning.

29. Pre-Search/Deployment Checks – **"COMPLETE"** (LM)(E)

***WARNING*****: (T-2)** If the drop is aborted after completion of the Pre-Deployment Checks, the loadmaster will ensure the aft anchor cable supports are raised prior to requesting the closure of the ramp and door.

**EQUIPMENT DEPLOYMENT CHECKLIST**
*(MA-1 Kit, Parabundle, and Freefall)*
*LOADMASTER*

***NOTE:*** **(T-2)** The pilot will initiate this checklist by briefing the pattern and delivery to be flown.

***NOTE:*** **(T-2)** If the Pre-Search/Deployment Checklist has already been accomplished and the aircraft configuration will not be changed for the delivery pattern, e.g., flap settings and/or doors, rescue equipment drops can commence immediately.

***NOTE:*** **(T-2)** The loadmaster should acknowledge pilot's calls (e.g. "Turning base for Parabundle" etc.) for situational awareness and crew coordination.

1. **"30 SECONDS TO TARGET"** (P)

2. **"10 SECONDS TO TARGET"** (P)

3. **"TARGET IN SIGHT"** (Parabundle Only) (LM)

4. Corrections (Parabundle Only; 10 degrees left/10 degrees right etc.)

5. **"LOAD CLEAR"** (LM)

## PERSONNEL DEPLOYMENT CHECKLIST

*LOADMASTER*

This checklist will be used for jumpmaster directed (JMD) airdrops and pararescue deployment (PJD)/equipment airdrops utilizing the fixed, moving, and crosswind target patterns. **(T-2)**

1. **"PERSONNEL DEPLOYMENT CHECKLIST"** (P)

2. **"PERSONNEL DEPLOYMENT CHECKLIST ACKNOWLEDGED LM"** (LM)

3. **"CREW, ONE-MINUTE WARNING"** (P/CP)

***NOTE:*** **(T-2)** Jumpers may move aft of the ramp hinge at jumpmasters discretion after the one-minute warning is called.

4. Load Release Gate – Checked

5. Aft Restraint – Removed (As required)

***WARNING*****: (T-1)** Upon hearing a "No Drop" call, the PM will turn the red light on and, along with the loadmaster, acknowledge the "No Drop." If the CRL is held in place by only the release gate strap, all personnel on the cargo ramp will move forward of forward most load, except the loadmaster and jumpmaster who will monitor the CRL for possible shifting and secure as necessary.

6. **"SAFETY CHECKS COMPLETE"** (LM/JM)

***WARNING:*** **(T-2)** Jumpmasters will run their Safety Checklist. The loadmaster is responsible for accomplishing all other appropriate checklists and overall safety in the cargo compartment. When either the loadmaster or jumpmaster responds "Safety Check Complete," this indicates that both the personnel/equipment and safetyman checklists have been completed on all jumpers exiting on this pass.

***WARNING:*** **(T-2)** Each jumper will be responsible for monitoring their own static line. ***EXCEPTION:*** The loadmaster will hold the jumpmaster's static line if the jumpmaster is exiting from a paratroop door on the pass. The loadmaster will monitor the jumpmaster's static line at all times unless preparing the CRL or equipment for deployment. Jumpmasters will remove their reserve parachute and connect their static line clip to their parachute harness (the static line will not be connected to the anchor cable) prior to spotting from the aft edge of the ramp. An aircraft personnel restraint cable will be connected to D-ring on the jumpmaster's parachute.

***WARNING:*** **(T-2)** During paratroop door static line drops, personnel will not position themselves directly under the center anchor cable supports (A-frame, FS 737). Personnel in the cargo compartment during tailgate drops will not position themselves below the static line retriever cable while the cargo ramp and door are open.

7. **"CLEAR TO JUMP"** (P)

***WARNING:*** **(T-1)** When the pilot responds "Clear to Jump," this indicates that all conditions are favorable for personnel deployment. If any crewmember calls "NO DROP" after the "One-Minute Warning" call, no deployment will be made and the deployment phase of the checklist will be reinitiated.

***NOTES:*** **(T-2)** After hearing "Clear to Jump", the loadmaster will alert the jumpmaster and relay all visual corrections given by the jumpmaster to the pilot. The PM will turn on the green light.

8. Green Light – **"ON"** (P)

9. **"GATE RELEASED"** (or state condition) (As required) (LM)

***WARNING:*** **(T-2)** Before cutting the gate, the loadmaster will ensure the jumpmaster has moved forward of the CRL package. No person will be aft of the package during gate cut and deployment. If the CRL exists the aircraft, but fails to properly deploy (hangs up), the static lines will be cut immediately.

***CAUTION:*** **(T-2)** The release gate must be cut below the knot to allow the nylon strap to pull free through floor tiedown rings.

***NOTE:*** **(T-2)** The jumpmaster will signal the loadmaster to cut the release gate strap. If jumpers are tailgating, this signals that they are clear to follow the load. When jumpers use freefall parachutes, they will not deploy until after the loadmaster retrieves the CRL static lines/parachute D-bags. It may take up to 20 seconds for all equipment and personnel to exit the aircraft.

10. **"LOAD CLEAR"** (or state condition) (LM)

11. **"RED LIGHT"** (N)

***NOTE:*** The navigator will call for the red light to be turned on upon hearing the "load Clear" call or for any safety of flight issue and/or emergency.

12. **"ON"** (P/CP)

13. Jumpmaster/Safety – Notify (If required)

***NOTE:*** **(T-2)** If personnel drops are complete or if the aircraft or door configuration will be changed, the pilot will call for the POST-DEPLOYMENT Checklist. If additional drops are planned, continue with the racetrack patterns and PERSONNEL DEPLOYMENT Checklist. Deploy additional jumpers using the drop heading and count established by the jumpmaster. Disregard the spotter chute.

## POST-SEARCH/POST-DEPLOYMENT CHECKLIST

*LOADMASTER*

The pilot will initiate this checklist by calling for the "Post-Search Checklist" or "Post-Deployment Checklist" as appropriate for the maneuver being flown. **(T-2)**

***NOTE:*** **(T-2)** For multiple drops, the POST-SEARCH/DEPLOYMENT Checklist is not required until after completion of the last drop, but each pattern and delivery will be briefed. As a minimum, brief the type of equipment to be delivered, delivery method (shape, relationship to wind, etc.), altitudes, airspeeds, commands to be used, and required actions for malfunctions. This checklist must be accomplished prior to initiating a different type checklist. Accomplish applicable steps of the Post-Search/Deployment Checklist and re-accomplish the Pre-Search/Deployment Checklist, as required, when necessary to change the aircraft or door configuration.

1. **"POST-SEARCH/POST-DEPLOYMENT CHECKLIST"** (P)

2. **"POST-SEARCH/POST-DEPLOYMENT CHECKLIST ACKNOWLEDGED LM"** (LM)

3. Static Lines – Retrieved/Cut

***WARNING:*** **(T-2)** If unable to retrieve static line(s), cut on the command of the pilot.

***CAUTION:*** **(T-2)** Prior to retrieving static line(s), allow a few seconds for the static lines to wrap together.

4. Jump Platform(s) – Folded In (If required)

5. Anchor Cable Supports – Raised (If required)

***CAUTION:*** **(T-2)** Anchor cables will be removed from A-Frame prior to raising supports (paratroop door only).

6. Restraint Shuttles (Some airplanes) – Positioned

***WARNING:*** Prior to closing the cargo ramp, position all restraint shuttles forward of the center anchor cable support, with the restraint cable retained in the inboard slot of the center support by the pip pin.

7. Ramp and Door/Paratroop Door(s) (As Required) –**"CLOSED AND LOCKED"** (LM)

***WARNING:*** **(T-2)** The loadmasters will ensure that the life line is attached to a point that will preclude exiting the aircraft, prior to proceeding aft to operate the cargo ramp and door controls.

***CAUTION:*** **(T-2)** Ensure the ramp and door area is clear of all obstructions prior to initiating closing procedures.

***NOTE:*** **(T-2)** If both the cargo ramp and door and a paratroop door were open for loadmaster-directed rescue equipment airdrops, close the cargo ramp and door first, then the paratroop door.

***NOTE:*** **(T-2)**The loadmaster will close the ramp and door as soon as they clear the area of static lines and anchor cable supports.

***NOTE:*** **(T-2)**Visually check the ramp and door locks after closing.

8. Flare Launcher Control Panel – Set (As required)

***NOTE***: **(T-2)** Position the ARM/SAFE switches as required for the mission to be performed and deactivate the system.

9. Cabin – Secured

a. Loose Equipment – Stowed/Secured

b. Emergency Equipment – Stowed/Secured

c. Static Line Retriever Cable – Rewind/Repositioned (As required)

d. Oxygen – Set (Regulators and consoles set as required)

e. Galley Floor – Up

10. NVGs – **“ON/OFF/READY”** (If required)(state condition) (P)(CP)(N)(AMSS)(LM)(E)

11. Post-Search/Post-Deployment Checks – **"COMPLETE"** (LM)(E)

a. The flight engineer will read this step as "Post-Search Checklist" or "Post-Deployment Checklist" as appropriate for the maneuver being flown. **(T-2)**

# Attachment 4

## AMPLIFIED FORWARD AREA REFUELING POINT (FARP) / HOT REFUELING CHECKLISTS

**A4.1. General.** Checklists are written for normal and contingency operations.

A4.1.1. **(T-2)** FARP/Hot Refueling checklist may be accomplished in conjunction with the INFIL/EXFIL or AFTER LANDING (for operational Stop) checklist. Duplicate steps may be omitted when using these checklists. When applicable the flight engineer will complete the UARSSI system check during aircraft preflight. Checklists are applicable to those aircraft equipped with and without the UARRSI modification. When using the INFIL/EXFIL checklist, perform ON THE RUNWAY Checklist (through Step 2) as follows:

1. Ramp and Door – **"CLEAR TO OPEN"** (P)

2. **"CLEAR TO OFFLOAD"** (P)

A4.1.2. **Hot brake/Hung Flare checks.** (T-1) Hung Flare checks (if required) will be accomplished prior to entering the hot refueling site. The loadmaster will state "CLEAR TO TAXI" after completion of required checks and when cargo compartment is secure. Aircraft will then taxi into refueling area. A Hot Brake Check will be completed if Hot Brakes are suspected.

A4.1.3. **(T-2)** If flight operations will continue after FARP / Hot Refueling operations, complete the ON THE RUNWAY CHECKLIST if using INFIL/EXFIL procedures or resume with the BEFORE TAKEOFF Checklist if using normal checklist.

***NOTE:*** **(T-2)** After the FARP / Hot Refueling Checklist has been called complete, ensure that all radios, navigational equipment, and ECM equipment is set as required to continue the mission. This equipment is covered in the INFIL/EXFIL and BEFORE TAKEOFF checklists.

A4.1.4. If the sortie will terminate after refueling, complete the AFTER LANDING Checklist.

**A4.2. Hot Refueling (Receiver) Checklist (Pilot/Front End Crew).** **HOT REFUELING (RECEIVER) CHECKLIST**

*PILOT/FRONT END CREW*

1. **"CREW, HOT REFUELING (RECEIVER) CHECKLIST"** (P)

2. **"HOT REFUELING (RECEIVER) CHECKLIST ACKNOWLEDGED LM"** (LM)

3. Crew Briefing – **"COMPLETE"** (P)

***NOTE:*** See AFI 11-2HC-130V3 CL-1 for Briefing Guide.

4. Radios and Navigational Equipment - **"SET"** (P)(CP)(N)(AMSS)(LM)(E)

a. Radios – Set (as required)

b. Radar – Standby/Off

c. Radar altimeters – Off

d. Doppler/DVS (some aircraft) – Off

e. IFF – Standby

***WARNING****:* Do not operate the radar, radar altimeters or transmit on HF during fuel transfer operations.

5. Defensive Systems – **"OFF"** (N)

***WARNING****:* (T-1) Do not operate defensive systems/equipment during fuel transfer operations. Ensure AN/ALE-40/47 system has been deactivated and safety pins installed. For AN/ALE-40 place ARM-TEST-SAFE Switch to SAFE. For the AN/ALE-47 place the MODE Select Switch to OFF.

6. Defensive System Safety Pins – **"INSTALLED"** (LM)

7. Oil Cooler Augmentation Switches (Some aircraft) – As required (E)

8. Exits – **"CLEARED TO OPEN"** (As required) (P)

9. **"CLEARED TO OFFLOAD"** (P)

***NOTE:*** **(T-2)** Complete Hot brake/Hung Flare checks at this time if not completed prior to entering the hot refueling site.

10. Hot Brake/Hung Flare Check – **"COMPLETE / COMPLETE, CLEAR TO TAXI"** (LM)

***WARNING****:* **(T-2)** If the brakes are hot, delay refueling operations until the brakes have cooled.

***NOTE:*** If Hot Brake /Hung Flare Check is conducted outside refueling zone, call will be "COMPLETE, CLEAR TO TAXI".

11. UARRSI Panel (some aircraft) – Set (E)

a. Air refueling power switch – On

b. Tank selector switches – As required

12. SPR Panel – "**SET"** (PO)

***NOTE:*** **(T-3)** Loadmaster will coordinate with FE for tank selection and fuel distribution.

13. Fuel Tank Fill Valves Check (As required)[Non-UARRSI] -

a. Master Switch –

| | |
|---|---|
| (1) **"PRE-CHECK PRIMARY"** | (E) |
| (2) **"SET"** | (PO) |
| (3) Checked (Flow should stop) | (E) |

b. Master switch –

| | |
|---|---|
| (1) **"REFUEL/GROUND TRANSFER"** | (E) |
| (2) **"SET"** | (PO) |
| (3) Checked (Flow should start) | (E) |

c. Master Switch –

| | |
|---|---|
| (1) **"PRE-CHECK SECONDARY"** | (E) |
| (2) **"SET"** | (PO) |
| (3) Checked (Flow should stop) | (E) |

d. Master switch –

| | |
|---|---|
| (1) **"REFUEL/GROUND TRANSFER"** | (E) |
| (2) **"SET"** | (PO) |
| (3) Checked (Flow should start) | (E) |

***CAUTION****:* **(T-2)** The primary and secondary fuel tank shutoff valves must be checked any time the fuel tanks are to be filled to capacity.

***CAUTION****:* **(T-2)** Maintain fuel balance IAW applicable flight manual by use of the tank selector switches. During fill checks, inspect each wing tip overflow vent for leakage. Do not stop fuel flow by closing the refueling crank handle. Use the offload valve to start and stop fuel flow. If fuel flow does not stop within 15 seconds, do not fill tank to capacity using the SPR.

| | |
|---|---|
| 14. **"FUEL ONLOAD COMPLETE"** | (E) |
| 15. UARRSI Panel (some aircraft) - **"SET"** | (E) |

a. Air refueling power switch – On

b. Line drain switch – On

***NOTE:*** **(T-3)** When the Refuel panel light goes out, the engineer will set the UARRSI panel to line drain and remain in this position for approximately 8 to 10 minutes.

c. Line drain switch – Off

d. Air refueling power switch – Off

16. **"SPR PANEL DOOR CLOSED AND SECURED"** (PO)

17. Oil Cooler Augmentation Switches (some aircraft) – As Required (E)

18. **"CLEAR TO TAXI"** (LM)

19. Radios and Navigational Equipment - **"SET"** (P)(CP)(N)(AMSS)(LM)(E)

a. Radios - Set (as required)

b. Radar Standby/On

c. Radar altimeters – On/Set As Required

d. Doppler/DVS (some aircraft) – On

e. IFF – Standby/On

20. Defensive Systems – **"SET, STATE SETTINGS"** (N)

21. Defensive System Safety Pins – **"REMOVED / INSTALLED"** (LM)

22. Fuel Contamination Check – Complete (E)

***NOTE:*** **(T-2)** Fuel contamination check may be accomplished anytime after fuel onload is complete.

23. Hot Refueling (Receiver) Checks – **"COMPLETE"** (LM)(E)

**A4.3. Hot Refueling (Receiver) Checklist (Cargo Compartment Crew).** **HOT REFUELING (RECEIVER) CHECKLIST**

*CARGO COMPARTMENT CREW*

1. "**CREW, HOT REFUELING (RECEIVER) CHECKLIST"** (P)

2. **"HOT REFUELING (RECEIVER) CHECKLIST ACKNOWLEDGED LM"** (LM)

3. Radios and Navigational Equipment – **"SET"** (P)(CP)(N)(AMSS)(LM)(E)

   a. Radios - Set (as required)

***WARNING****:* (T-1) Do not operate the radar, radar altimeters or transmit on HF during fuel transfer operations.

4. Defensive System Safety Pins – **"INSTALLED"** (LM)

***WARNING:*** **(T-1)** Do not operate defensive systems/equipment during fuel transfer operations. Ensure AN/ALE-40/47 system has been deactivated and safety pins are installed.

5. Exits – Open on pilot's command (LM)

6. **"CLEARED TO OFFLOAD"** (P)

***NOTE:*** Complete Hot brake/Hung Flare checks at this time if not completed prior to entering the hot refueling site.

***NOTE:*** **(T-3)** When the pilot gives the clearance to offload, the LM may open the right paratroop door and prepare for equipment placement.

7. Hot Brake /Hung Flare Check – **"COMPLETE / COMPLETE, CLEAR TO TAXI"** (LM)

***WARNING****:* **(T-2)** If the brakes are hot, delay refueling operations until the brakes have cooled.

***NOTE:*** **(T-2)** If Hot Brake /Hung Flare Check is conducted outside refueling zone, call will be "COMPLETE, CLEAR TO TAXI".

8. Fire Extinguisher – Positioned (PO)

***NOTE*****: (T-2)** The Fire extinguisher will be positioned between the Single Point Refueling Panel and the refueling equipment.

9. Refueling Equipment – Positioned (PO)

***CAUTION*****: (T-2)** Aircraft ramp will be raised to allow the aircraft to taxi in the event of an emergency.

10. Bonding Wire – Attached (PO)

***WARNING:*** Bonding will be accomplished by inserting the bonding plug into the aircraft's external receptacle prior to any other action.

11. Single Point Refueling Panel – Open (PO)

12. Refueling Nozzle - Connected and checked (PO)

***WARNING:*** **(T-2)** Ensure the refueling nozzle is locked and checked for security prior to pressurizing refueling hoses. Failure to check security of the nozzle could result in a fuel spill.

a. Refueling nozzle – Connected

b. Nozzle flow valve – Opened

c. Refueling nozzle – Locked and checked for security (prior to pressurizing hoses)

***WARNING:*** **(T-2)** Connect the SPR nozzle to the aircraft. With the SPR nozzle crank handle in the closed position, check the strainer coupling quick disconnect device for positive locking. Prior to pressurizing the hose, be sure the nozzle is securely locked to the aircraft by attempting to remove the nozzle with the nozzle crank handle in the open position. Any nozzle that can be disconnected from the SPR with the nozzle crank handle in the open position is defective and must be removed from service immediately. Check the strainer quick disconnect locking device for positive engagement and assuring the refueling nozzle is securely locked.

***NOTE:*** The flight engineer will coordinate the fuel onload with the loadmaster for Non-UARRSI.

13. SPR Panel – "**SET**" (PO)

a. Master switch - Refuel/ground transfer

b. Tank selector switches - Open (for required tanks) [non-UARRSI aircraft only]

***NOTE:*** **(T-2)** PO will coordinate with FE for tank selection and fuel distribution.

c. Offload valve – Open

***NOTES:*** TYPICAL HAND SIGNALS:

- OK or Transfer Fuel: Hand raised thumbs up.
- A negative flow: Hand raised thumbs down.
- Servicing complete stop fuel flow: Hand moving in large circular motion.

***NOTE:*** **(T-2)** PO will inspect for leaks and fuel flow.

14. Fuel Tank Fill Valves Check (As required) [Non-UARRSI] –

***WARNING:*** **(T-2)** Do not stop fuel flow by closing the nozzle flow valve. Use the offload valve to start and stop fuel flow. If fuel flow does not stop within 15 seconds, do not fill tank to capacity using the SPR.

a. Master Switch –

| | |
|---|---|
| (1) **"PRE-CHECK PRIMARY"** | (E) |
| (2) **"SET"** | (PO) |
| (3) Checked (Flow should stop) | (E) |

b. Master switch –

| | |
|---|---|
| (1) **"REFUEL/GROUND TRANSFER"** | (E) |
| (2) **"SET"** | (PO) |
| (3) Checked (Flow should start) | (E) |

c. Master Switch –

| | |
|---|---|
| (1) **"PRE-CHECK SECONDARY"** | (E) |
| (2) **"SET"** | (PO) |
| (3) Checked (Flow should stop) | (E) |

d. Master switch –

| | |
|---|---|
| (1) **"REFUEL/GROUND TRANSFER"** | (E) |
| (2) **"SET"** | (PO) |
| (3) Checked (Flow should start) | (E) |

***CAUTION:*** **(T-2)**The primary and secondary fuel tank shutoff valves must be checked any time the fuel tanks are to be filled to capacity.

***CAUTION:*** **(T-2)** Maintain fuel balance IAW applicable flight manual by use of the tank selector switches. During fill checks, inspect each wing tip overflow vent for leakage.

| | |
|---|---|
| 15. **"FUEL ONLOAD COMPLETE"** | (E) |
| 16. SPR Panel – Set | (PO) |

a. Tank selector switches – Closed [non-UARRSI aircraft only]

b. Offload valve – Closed

***WARNING:*** **(T-2)** Do not stop refueling by closing the nozzle flow valve. Use the offload valve to start and stop fuel flow.

17. Refueling Master Switch – Drain / Off (PO)

a. On UARRSI modified aircraft the PO will place the Refueling master switch to the Off position.

b. On Non-UARRSI aircraft the PO will place the Refueling Master switch to the Drain position. The Refueling Master switch will remain in the Drain position for a minimum of 5 minutes prior to competing Step 21.

18. Nozzle Flow Valve – Closed (PO)

19. Refueling Nozzle – Disconnected (PO)

a. Dust caps – Installed

20. Bonding Wire – Removed (PO)

21. Refueling Master Switch – OFF (PO)

***NOTE:*** [Non-UARRSI aircraft only], prior to placing the master switch to Off, leave the master switch in Drain for approximately 5 minutes.

22. **"SPR PANEL DOOR CLOSED AND SECURED"** (PO)

23. Fire Extinguisher – Repositioned (PO)

24. **"CLEAR TO TAXI"** (LM)

25. Radios and Navigational Equipment – "**SET"** (P)(CP)(N)(AMSS)(LM)(E)

a. Radios - Set (As required)

26. Defensive System Safety Pins – **"REMOVED/INSTALLED"** (LM)

27. Hot Refueling (Receiver) Checks – **"COMPLETE"** (LM)(E)

**A4.4. FARP / Hot Refueling (Tanker) Checklist (Pilot/Front End Crew).** **<u>FARP / HOT REFUELING (TANKER) CHECKLIST</u>**

*PILOT/FRONT END CREW*

***NOTE:*** **(T-2)** This checklist will be used for FARP tanker or hot refueling (tanker) operations.

1. **"CREW, FARP / HOT REFUELING (TANKER) CHECKLIST"** (P)

2. **"FARP / HOT REFUELING (TANKER) CHECKLIST ACKNOWLEDGED LM"** (LM)

3. Crew Briefing – **"COMPLETE"** (P)

   a. See AFI 11-2HC-130V3 CL-1 for Briefing Guide.

4. Radios and Navigational Equipment – **"SET"** (P)(CP)(N)(AMSS)(LM)(E)

   a. Radios – Set (As required)

   b. Radar – Standby/Off

   c. Radar altimeters – Off

   d. Doppler/DVS (some aircraft) – Off

   e. IFF – Standby

***WARNING:*** **(T-1)** Do not operate the radar, radar altimeters or transmit on HF during fuel transfer operations.

5. Defensive Systems – **"OFF"** (N)

***WARNING:*** **(T-2)** Do not operate defensive systems/equipment during fuel transfer operations. Ensure AN/ALE-40/47 system has been deactivated and safety pins installed. For AN/ALE-40 place ARM-TEST-SAFE Switch to SAFE. For the AN/ALE-47 place the MODE Select Switch to OFF.

6. Defensive System Safety Pins – **"INSTALLED"** (LM)

7. Oil Cooler Augmentation Switches (Some aircraft) – As required (E)

8. Exits – **"CLEARED TO OPEN"** (As required) (P)

9. **"CLEARED TO OFFLOAD"** (P)

***NOTE:*** Complete Hot brake/Hung Flare checks at this time if not completed prior to entering the hot refueling site.

10. Hot Brake/Hung Flare Check – **“COMPLETE / COMPLETE, CLEAR TO TAXI”** (LM)

***WARNING:*** **(T-2)** If the brakes are hot, delay refueling operations until the brakes have cooled.

***NOTE:*** If Hot Brake /Hung Flare Check is conducted outside refueling zone, call will be “COMPLETE CLEAR TO TAXI”.

11. Dump Pump Switches – On (E)

***NOTE:*** Turn the dump pumps on when the refuel panel light illuminates.

12. **"FUEL OFFLOAD COMPLETE"** (PO/HRS/E)

13. Dump Pumps – Off (E)

***NOTES***:

[UARRSI aircraft only] Turn the dump pumps off when the refuel panel light goes out.

[Non-UARRSI aircraft only] Turn the dump pumps off when the fuel offload is complete.

14. UARRSI Panel (some aircraft) – Set (E)

a. Air refueling power switch – On

b. Line drain switch – On

***NOTE:*** **(T-2)** When the refuel panel light goes out, the engineer will set the UARRSI panel to line drain and remain in this position for approximately 8 to 10 minutes.

c. Line drain switch – Off

d. Air refueling panel power switch – Off

15. **“SPR PANEL DOOR CLOSED AND SECURED”** (PO)

16. Oil Cooler Augmentation Switches (Some aircraft) – As required (E)

17. **“CLEAR TO TAXI”** (LM)

18. Radios and Navigational Equipment – **"SET"** (P)(CP)(N)(AMSS)(LM)(E)

a. Radios - Set (As required)

b. Radar Standby/On

c. Radar altimeters – On/Set As Required

d. Doppler/DVS (some aircraft) – On

e. IFF – Standby/On

19. Defensive Systems – **"SET, STATE SETTINGS"** (N)

20. Defensive System Safety Pins – **"REMOVED/INSTALLED"** (LM)

21. Hot Refueling (Tanker) / FARP Checks – **"COMPLETE"** (LM)(E)

**A4.5. Hot Refueling (Tanker) Checklist (Cargo Compartment Crew).** **HOT REFUELING (TANKER) CHECKLIST**

*CARGO COMPARTMENT CREW*

***NOTE:*** **(T-2)** This checklist will be used for other than FARP operations.

1. "**CREW, HOT REFUELING (TANKER) CHECKLIST"** (P)

2. **"HOT REFUELING (TANKER) CHECKLIST ACKNOWLEDGED LM"** (LM)

3. Radios and Navigational Equipment – **"SET"** (P)(CP)(N)(AMSS)(LM)(E)

a. Radios - Set (As required)

***WARNING:*** **(T-1)** Do not operate the radar, radar altimeters or transmit on HF during fuel transfer operations.

4. Defensive System Safety Pins – **"INSTALLED"** (LM)

***WARNING:*** **(T-2)** Do not operate defensive systems/equipment during fuel transfer operations. Ensure AN/ALE-40/47 system has been deactivated and safety pins are installed.

5. Exits – Open On Pilot's Command (LM)

6. **"CLEARED TO OFFLOAD"** (P)

***NOTE*****: (T-2)** When the pilot gives the clearance to offload, the LM may open the right paratroop door and prepare for equipment placement.

***NOTE:*** **(T-2)** Complete Hot brake/Hung Flare checks at this time if not completed prior to entering the hot refueling site.

7. Hot Brake /Hung Flare Check – **"COMPLETE / COMPLETE, CLEAR TO TAXI"** (LM)

***WARNING:*** **(T-2)** If the brakes are hot, delay refueling operations until the brakes have cooled.

***NOTE:*** **(T-2)** If Hot Brake /Hung Flare Check is conducted outside refueling zone, call will be "COMPLETE, CLEAR TO TAXI".

8. Fire Extinguisher – Positioned (PO)

***NOTE*****:** **(T-2)** The Fire extinguisher will be positioned between the Single Point Refueling Panel and the refueling equipment.

9. Refueling Equipment – Positioned (PO)

***CAUTION*****:** **(T-2)** Aircraft ramp will be raised approximately 12 inches off the ground to allow the aircraft to taxi in the event of an emergency.

10. Bonding Wire – Attached (PO)

***WARNING*****:** **(T-2)** Bonding will be accomplished by inserting the bonding plug into the aircraft's external receptacle prior to any other action.

11. Single Point Refueling Panel – Open (PO)

12. Refueling Nozzle – Connected and Checked (PO)

***WARNING:*** **(T-2)** Ensure the refueling nozzle is locked and checked for security prior to pressurizing refueling hoses. Failure to check security of the nozzle could result in a fuel spill.

a. Refueling nozzle – Connected

b. Nozzle flow valve – Opened

c. Refueling nozzle – Locked and checked for security (prior to pressurizing hoses)

***WARNING*****:** **(T-2)** Connect the SPR nozzle to the aircraft. With the SPR nozzle crank handle in the closed position, check the strainer coupling quick disconnect device for positive locking. Prior to pressurizing the hose, be sure the nozzle is securely locked to the aircraft by attempting to remove the nozzle with the nozzle crank handle in the open position. Any nozzle that can be disconnected from the SPR with the nozzle crank handle in the open position is defective and must be removed from service immediately. Check the strainer quick disconnect locking device for positive engagement and assuring the refueling nozzle is securely locked.

13. Receiver – Ready (PO)

***NOTE:*** TYPICAL HAND SIGNALS:

- OK or Transfer Fuel – Hand raised thumbs up.
- A negative flow – Hand raised thumbs down.
- Servicing complete stop fuel flow – Hand moving in large circular motion.

14. Master Switch – Defuel (PO)

15. Offload Valve – Open (PO)

***NOTE:*** LM will inspect for leaks and fuel flow.

16. **"FUEL OFFLOAD COMPLETE"** (PO/E)

17. Offload Valve – Closed (PO)

***WARNING:*** **(T-2)** Do not stop refueling by closing the nozzle flow valve. Use the offload valve to start and stop fuel flow.

18. Refueling Master switch **–** Drain / Off (PO)

***NOTE:*** [Non-UARRSI aircraft only] At this time, notify the engineer to turn the dump pumps off

a. On UARRSI modified aircraft the PO will place the Refueling master switch to the Off position. **(T-2)**

b. On Non-UARRSI aircraft the PO will place the Refueling Master switch to the Drain position. The Refueling Master switch will remain in the Drain position for a minimum of 5 minutes prior to competing Step 22. **(T-2)**

19. Nozzle Flow Valve – Closed (PO)

20. Refueling Nozzle – Disconnected (PO)

a. Dust caps – Installed

21. Bonding Wire – Removed (PO)

22. Refueling Master Switch – OFF (PO)

***NOTE*:** [Non-UARRSI aircraft only], prior to placing the master switch to Off, leave the master switch in Drain for approximately 5 minutes.

23. **“SPR PANEL DOOR CLOSED AND SECURED”** (PO)

24. Fire Extinguisher – Repositioned (PO)

25. **“CLEAR TO TAXI”** (LM)

26. Radios and Navigational Equipment – "**SET"** (P)(CP)(N)(AMSS)(LM)(E)

a. Radios - Set (As required)

27. Defensive System Safety Pins – **"REMOVED/INSTALLED"** (LM)

28. Hot Refueling (Tanker) Checks – **“COMPLETE”** (LM)(E)

**A4.6. FARP Checklist (Cargo Compartment Crew).** **<u>FARP CHECKLIST</u>**

*CARGO COMPARTMENT CREW*

***NOTE*****:** This checklist is used for FARP tanker operations.

1. **“CREW, FARP CHECKLIST”** (P)

2. "**FARP CHECKLIST ACKNOWLEDGED LM**" (LM)
3. Radios and navigational equipment – "**SET**" (P)(CP)(N)(AMSS)(LM)(E)

***WARNING***: **(T-1)** Do not operate the radar, radar altimeters or transmit on HF during fuel transfer operations.

4. Defensive System Safety Pins – **"INSTALLED"** (LM)

5. Exits - Open On Pilot’s Command (HRS/PO)

6. **“CLEARED TO OFFLOAD”** (P)

***NOTE:*** **(T-2)** When pilot gives the clearance to offload, the HRS or PO may open the right paratroop door and prepare for equipment placement.

***NOTE:*** **(T-2)** Complete Hot brake/Hung Flare checks at this time if not completed prior to entering the hot refueling site.

7. Hot Brake /Hung Flare Check – **“COMPLETE / COMPLETE, CLEAR TO TAXI”** (HRS)

***WARNING****:* **(T-2)** If the brakes are hot, delay refueling operations until the brakes have cooled.

***NOTE:*** **(T-2)** If Hot Brake /Hung Flare Check is conducted outside refueling zone, call will be "COMPLETE, CLEAR TO TAXI".

8. Equipment Offload – Complete (HRS)

9. Bonding Wire – Attached (PO)

***WARNING:*** **(T-2)** Bonding will be accomplished by inserting the bonding plug into the aircraft's external receptacle prior to any other action.

10. Single Point Refueling Panel – Open (PO)

11. Refueling Nozzle – Connected and Checked (PO)

***WARNING:*** Ensure the refueling nozzle is locked and checked for security prior to pressurizing refueling hoses. Failure to check security of the nozzle could result in a fuel spill.

a. Refueling nozzle – Connected

b. Nozzle flow valve – Opened

c. Refueling nozzle – Locked and checked for security (prior to pressurizing hoses)

d. Valves – Open/Checked

***NOTE:*** Check refueling hose valves at the SPR nozzle and at the 50 GPM pump to ensure they are open

e. 50 GPM Pump Control Valves – Positioned refuel

***WARNING:*** **(T-1)** Connect the SPR nozzle to the aircraft. With the SPR nozzle crank handle in the closed position, check the strainer coupling quick disconnect device for positive locking. Prior to pressurizing the hose, be sure the nozzle is securely locked to the aircraft by attempting to remove the nozzle with the nozzle crank handle in the open position. Any nozzle that can be disconnected from the SPR with the nozzle crank handle in the open position is defective and must be removed from service immediately. Check the strainer quick disconnect locking device for positive engagement and assuring the refueling nozzle is securely locked.

12. Fire Extinguisher/Water Container – Positioned (PO)

***NOTE:*** Fire extinguisher and water container will be positioned in the vicinity of the Single Point Refueling Panel.

13. Refueling Hoses – Deployed (HDP)

14. Line Check – Complete (HRS)(PO)(HDP)

***NOTE:*** **(T-2)** HDP's will walk a designated section of refueling hose to check for twists, kinks, and to ensure that dry breaks are open. The PO will perform the same check on the 10 foot section of the hose and the tanker refueling nozzle. The HRS will perform the same check on the remainder of the hoses to the 50 GPM pump.

***NOTE:*** **(T-2)** The HRS may stand by at the 10 foot section until the PO pressurizes the system. This will enable them to complete the leak check.

15. Refueling Equipment – Positioned (HRS/HDP)

***NOTE:*** **(T-2)** A five gallon jerry can or igloo filled with water will be positioned in the vicinity of the HRS.

16. Aircraft Ramp – Raised (HRS/PO)

***NOTE:*** **(T-2)** Raise the ramp approximately 12 inches above the ground. The HRS/PO may delay raising the ramp until immediately prior to pressurizing the hoses. This action may help dissipate static electricity.

***WARNING:*** **(T-2)** Aircraft ramp will be raised to allow the aircraft to taxi in the event of an emergency.

17. Refueling Master switch – Defuel (PO)

18. Offload valve – Open (PO)

***NOTE:*** Ensure all points are pressurized to facilitate leak check

a. Pressure – Checked

19. Leak Check – Complete (HRS)(PO)(HDP)

***NOTE:*** **(T-2)** HDP's will walk a designated section of refueling hose to check for leaks. The PO will perform the same check on the 10 foot section of the hose and the tanker refueling nozzle. The HRS will perform the same check on the remainder of the hose to the 50 GPM pump.

20. Receiver – Ready (HDP)

a. Bonding wire – Connected

***WARNING:*** **(T-2)** Insert the bonding plug into the aircraft's external receptacle prior to any other action

b. Refueling nozzle – Connected

c. Fire guard – In place

***NOTE:*** TYPICAL HAND SIGNALS:

- OK or Transfer Fuel – Hand raised thumbs up.
- A negative flow – Hand raised thumbs down.
- Servicing complete stop fuel flow – Hand moving in large circular motion.

21. **"FUEL OFFLOAD COMPLETE"** (HRS)

22. Offload Valve – Closed (PO)

***WARNING:*** **(T-2)** Do not stop refueling by closing the nozzle flow valve. Use the offload valve to start and stop fuel flow.

23. Refueling Master Switch – Drain / Off (PO)

***NOTE:*** [Non-UARRSI aircraft only] At this time, notify the engineer to turn the dump pumps Off.

a. On UARRSI modified aircraft the PO will place the Refueling master switch to Off. **(T-2)**

b. On Non-UARRSI aircraft the PO will place the Refueling Master switch to Drain and open the tank refill valves. **(T-2)**

***NOTE:*** Opening the tank refill valves facilitates evacuation of the refuel hoses more rapidly.

24. External Drain Pump Control Valves – Positioned defuel (PO)

***NOTE:*** Configure the valves on the external drain pump to drain the hoses.

25. External Drain Pump – On (PO)

26. Leak Check – Complete (PO)

27. Refueling Hoses – Drained (HDP/HRS)

a. Upon completion of a section of hose, close one of the UNISEX couplers (HDP).

***NOTE:*** Do not close both Unisex valves. Doing so will allow the hoses to inadvertently disconnect during rewind operation. **(T-2)**

28. Hoses – Rolled/Stowed (HDP/HRS)

29. Nozzles, Fire Extinguishers, Water Bottles – Stowed (HRS/HDP)

30. External Drain Pump – Off (PO)

31. Ten Foot Hose Section – Disconnected/Drained (PO)

32. Nozzle Flow Valve – Closed (PO)

33. Refueling Nozzle – Disconnected (PO)

  a. Dust caps – Installed

34. Bonding Wire – Removed (PO)

35. Refueling Master Switch – Off (PO)

***NOTE:*** [For non-UARRSI aircraft] Prior to placing the master switch to OFF, leave the master switch in DRAIN for approximately 5 minutes after the refueling hoses have been drained.

36. **"SPR PANEL DOOR CLOSED AND SECURED"** (PO)

37. Aircraft Ramp – Positioned for Onload (HRS)

38. Equipment and Personnel – Loaded and Secured (LM)

  a. Ramp raised for taxi

39. "**CLEARED TO TAXI**" (LM)

40. Radios and Navigational Equipment – "**SET**" (P)(CP)(N)(AMSS)(LM)(E)

41. Defensive System Safety Pins – **"REMOVED/INSTALLED"** (LM)

42. FARP Checks – "**COMPLETE**" (PO)(HRS)(E)

**A4.7. FARP / Hot Refueling Emergency Procedures. (T-2)** Emergency procedures are not an exact science. Common sense and sound judgment should prevail. However, crews should follow guidelines during hot refueling operations. Remember that the LM, HRS and PO is the eyes and ears of the crew during all hot refueling operations. Escape routes should be established for each aircraft in the event of an emergency. The escape route should be depicted on the hot refueling site survey and must be reviewed prior to the mission. Crews must monitor radios to ensure they receive any evacuation call and must be ready to break radio silence and notify other participants in the event they experience an emergency.

A4.7.1. In an emergency shut down refueling operations by closing the offload valve switch. The emergency signal for stopping fuel flow is arm and hand extended level with shoulder, palm downward, moving from left to right in front of the body. At night, the same procedure will be used while holding an overt/covert chemlight.

A4.7.2. Emergency procedures checklist.

**AIRCRAFT EGRESS**

Use this checklist when a catastrophic emergency precludes moving the aircraft and ground egress is the only option.

1. Crew Notified – **"EGRESS, EGRESS, EGRESS"** (Any crew member)

***NOTE:*** **(T-2)** Any crewmember recognizing an emergency that precludes moving the aircraft will notify the crew "Egress, Egress, Egress."

***NOTE:*** Pilot will initiate the appropriate flight manual section III Ground Evacuation Emergency Procedure.

2. Refueling Operation – Shut Down (HRS/PO/HDP)

3. Refueling Nozzle/Bonding Wire – Removed (HRS/PO/HDP)

**AIRCRAFT FIRE/SPARKS/AIRCRAFT TAXI**

1. Refueling Operation – Shut Down (HRS/PO/HDP)

2. Refueling Nozzle/Bonding Wire – Removed (HRS/PO/HDP)

3. 50 GPM Pump – Unplugged (If time permits)

4. Notify Pilot – **"TAXI, TAXI, TAXI"** (HRS/PO)

5. Aircraft – Taxied (P)

***NOTE:*** Pilot will taxi the aircraft to the prebriefed rendezvous location and wait for HRS/PO/HDP personnel.

6. Controlling Agency / Fire Department – Notified (CP)

7. Fire/Sparks – Extinguish fire or determine cause of sparks (HRS/PO/HDP)

***NOTE:*** **(T-2)** The 20 lb dry chemical fire extinguisher will provide a limited firefighting capability and must be used as quickly as possible when needed if it is to be effective. During training, crash recovery equipment will be on site or on call; however, during actual employment or exercises, the 20 lb dry chemical fire extinguisher may be all that is available.

## FUEL LEAK/SPILL

1. Refueling Operation – Shut Down (HRS/PO/HDP)

2. Controlling Agency / Fire Department – Notified (CP)

3. Pilot – Notified (HRS/PO)

4. Leak Cause – Determined (HRS/PO/HDP)

***NOTE:*** If it is determined that the leak is not repairable, terminate refueling operation

5. Nozzle/Hose – Replaced (HRS/PO/HDP)

6. Fuel Spill – Cleaned (HRS/PO/HDP)

***NOTE:*** Use spill cleanup kit.

## FUEL SPILL ON PERSONNEL

1. Refueling Operation – Shut Down (HRS/PO/HDP)

2. Pilot- Notified (HRS/PO)

3. Contaminated Clothing – Removed (HRS/PO/HDP)

4. Contaminated Area – Flushed (HRS/PO/HDP)

***NOTE:*** Clean the area with soap if possible. Continue irrigation of the contaminated area as long as burning persists.

***NOTE:*** Clean any fuel spill using absorbent material.

5. Controlling Agency / Fire Department – Notified (CP)

## Attachment 5

## AMPLIFIED MISCELLANEOUS CHECKLIST

**A5.1. (T-2) Engine Running Onload/Offload Checklist.** This checklist may be used to offload equipment, personnel or a combination of both. For Engine Running Crew Changes (ERCC) ensure both the enplaning and deplaning crew are briefed on the sequence of events and crew movement facilitating the crew change.

### <u>ENGINE RUNNING ONLOAD/OFFLOAD (ERO) CHECKLIST</u>

PILOT/CREW/LOADMASTER

***NOTE:*** **(T-2)** Complete the AFTER LANDING Checklist prior to running the ERO checklist. The pilot will initiate this checklist by stating "Crew, Engine Running Onload/Offload Checklist"

| | |
|---|---|
| 1. Crew Briefing – **"COMPLETE"** | (P) |
| a. ERO location and door | |
| b. Onload/Offload | |
| c. Taxi Procedures | |
| 2. Parking Brake – **"SET"** | (P) |
| 3. Low Speed Ground Idle – As required | (E) |
| 4. Flaps and Air Deflector Doors – As required | (E) |
| 5. Aircraft Lighting (Cargo, Wingtip & Landing Lights) – As required | (LM)(E) |
| 6. Passenger Briefing (Deplane only) – **"COMPLETE"** | (LM) |
| a. Passenger/ACM responsibilities during ERO | |
| b. Emergency Ground Egress | |
| c. Offload Instructions | |
| 7. Safety Observer (As required) – In position | |

***WARNING:*** **(T-2)** A safety observer, if used, will take position at the bottom of the flight deck ladder to monitor all personnel and cargo movement and transmit, over interphone, a verbal warning to any personnel.

***NOTE:*** **(T-2)** A safety observer should be used with a single loadmaster crew requiring ERO from cargo ramp and door. Use most appropriate crew member or extra crew member.

8. Interphone / PA System Switch (As required) – **"CHECKED"** (P)(CP)(N)(AMSS)(LM)(E)

***CAUTION:*** **(T-2)** HOT MIC transmissions are not transmitted through the PA system. If emergency communications with the cargo compartment is required, the interphone switch must be depressed.

***NOTE****:* If interphone is used, crew will check interphone system. If PA System is used set system as follows and check.

a. PWR – On

b. Speaker Selector – All

c. Interphone and PA system Switch – Interphone and PA

9. Door (ramp and door or crew entrance door) – **"CLEARED TO OPEN"** (P)

10. Onload/Offload – **"CLEARED TO ONLOAD/OFFLOAD"** (P)

a. Passengers deplane before cargo and enplane after cargo

b. Vehicles/Cargo – 300' straight, 50' prior to turn (ramp exit)

***NOTE:*** **(T-3)** When enplaning/deplaning crew members for an engine running crew change (ERCC) the checklist may be stopped at Step 10. When the new crew members have assumed their positions, they will resume the checklist at Step 10.

11. Documentation – Updated and complete (P)(LM)

a. Passenger and Cargo Manifests

b. Crew lists

c. Weight and Balance

12. Doors – **"CLOSED AND LOCKED"** (LM)

13. Cargo Compartment – **"SECURE, CLEAR TO TAXI"** (LM)

14. Interphone / PA System Switch (If required) – **"INTERPHONE"** (P)

15. HOT MIC – As required (P)(CP)(N)(AMSS)(LM)(E)

16. Passenger Briefing (Enplane only) – **“COMPLETE”** (LM)

17. ERO Checks – **“COMPLETE”** (LM)(E)

***NOTE:*** Resume with BEFORE TAKEOFF Checklist if flight will continue. If the mission will terminate, re-accomplish the AFTER LANDING Checklist.

**A5.2. Rear Vision Device In Flight Installation Checklist. REAR VISION DEVICE (RVD) INSTALLATION / REMOVAL CHECKLIST**

PILOT/CREW/LOADMASTER

***WARNING:*** **(T-1)** Cabin differential pressure will be 0 in. Hg for operations with RVD installed. Pressurizing aircraft may cause structural failure of RVD.

1. **“REAR VISION DEVICE INSTALLATION / REMOVAL CHECKLIST”** (P)

***WARNING:*** **(T-1)** Do not attempt to install a rear vision device (bubble) that does not have two handles integral to bubble frame. Keep your fingers away from the rim of the hatch and bubble when removing and installing or severe injury to the hands may result due to suction force.

***NOTES:*** **(T-1)** If above 10,000 feet MSL, consider oxygen requirements for the crew and passengers.

Steps in parenthesis ( ) are for device removal

2. Crew Briefing – **"COMPLETE"** (P)

   a. Altitude, Airspeed, and Aircraft Configuration.

   b. Emergency Procedures.

   c. Primary Bubble Operator/Loadmaster and Assistant.

3. Pressurization – Depressurizing/As Required (E)

***NOTE:*** **(T-1)** Advise the crew of pressurization and setting and exercise caution not to open doors prior to depressurizing.

4. Protective Equipment – **"ON"** (LM)

   a. Don Restraining Harness, Flight Gloves, and Helmet.

***NOTE:*** Position assistant at base of ladder to help in installation.

5. Flaps – **"SET, STATE SETTING"** (P/CP)

6. Airspeed – **"CHECKED"** (P)(CP)(E)

a. Slow Aircraft to Maintain 140-170 KIAS (140 KIAS Preferred)

***CAUTION:*** **(T-1)** Suction forces are considerably lower at 140 KIAS, which reduces the possibilities of personnel injury.

7. Pressurization – **"DEPRESSURIZED"** (If Required) (E)

***WARNING: (T-1)*** Ensure airplane is fully depressurized before opening any door. Failure to do so may result in airplane damage and/or personal injury.

8. Remove Hatch / (Remove RVD) (LM)

***NOTE:*** Keep a hand on center bar and release the hatch, next pull the hatch out and hand to assistant.

9. Install RVD / (Install Hatch) (LM)

***NOTE:*** Place and hold the rear pin of the bubble in the appropriate receptacle and keep bubble angled down to at least 45 degrees. While bubble is angled down, align the front of the bubble with the locking mechanism and lock the bubble in place.

10. RVD – **"INSTALLED / REMOVED"** (LM)

***NOTES:***

The assistant for supporting the loadmaster could be another loadmaster or any other available aircrew member.

11. RVD Checks – **"COMPLETE"** (LM)(E)